

CAREER & TECHNOLOGY STUDIES

DESIGN STUDIES

GUIDE TO STANDARDS AND IMPLEMENTATION

INTERIM 1994




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MAY 1994

Alberta

EDUCATION
CURRICULUM STANDARDS BRANCH



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This document was prepared for:

<i>Administrators</i>	✓
<i>Counsellors</i>	✓
<i>General Audience</i>	
<i>Parents</i>	
<i>Students</i>	
<i>Teachers</i>	✓

Program/Level: Career and Technology Studies/Secondary

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NOTE: Shaded areas within this document have been approved for optional implementation. Assessment conditions and criteria are in draft form and will be validated 1994-97.

Questions or comments about this Guide to Standards and Implementation are welcome and should be directed to:

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CAREER AND TECHNOLOGY STUDIES

PROGRAM PHILOSOPHY/RATIONALE

Through Career and Technology Studies (CTS), secondary education in Alberta is responding to the many challenges of modern society, helping young people develop daily living skills, and nurturing a flexible, well-qualified work force.

In Canada's information society, characterized by rapid change in the social and economic environment, students must be confident in their ability to respond to change and successfully meet the challenges they face in their own personal and work lives. In particular, they must make decisions about what they will do when they finish high school. Many students will enter the work force, others will continue their education. All students face the challenges of growing independence and responsibility, and of entering the highly competitive workplace and/or post-secondary programs.

Secondary schools also face challenges. They must deliver, on a consistent basis, high quality, cost-effective programs that students, parents and community find credible and relevant.

CTS helps schools and students meet these challenges. Schools can respond more efficiently and effectively to student and community needs and expectations by using the opportunities in the CTS curriculum to design courses and access school, community and distance learning resources. Students can develop the confidence they need as they move into adult roles by assuming increased responsibility for their learning; cultivating their individual talents,

interests and abilities; and defining and acting on their goals.

As an important component of basic education in Alberta secondary schools, CTS promotes students' achievement by setting clear expectations and recognizing students' success. Students in CTS develop competencies—that is, the knowledge, skills and attitudes students must demonstrate, or what they know and can do.

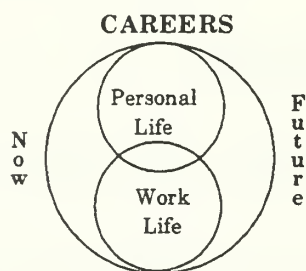
These competencies can be applied now and in the future as students make a smooth transition into adult roles in the family, community, workplace and/or further education. To help ensure this transition for students, clearly stated expectations and standards have been defined with the assistance of teachers, business and industry representatives and post-secondary educators.

CTS offers *all* students important learning opportunities. Regardless of the particular area of study chosen, students in CTS will:

- develop skills that they can apply in their daily lives now and in the future
- refine career-planning skills
- develop technology-related skills
- enhance employability skills
- apply and reinforce learnings developed in other subject areas.

In CTS, students build skills they can apply in their everyday lives. For example, in the CTS program, particularly at the introductory levels, students have the opportunity to improve their ability to make sound consumer decisions, and to appreciate environmental and safety precautions.

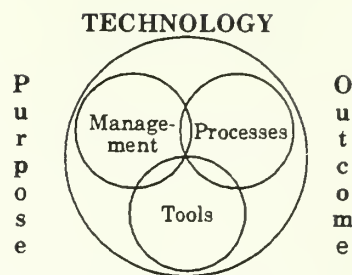
A career encompasses more than activities related to a person's job or occupation; it involves one's personal life in both local and global contexts; e.g., as a family member, a friend, a community volunteer, a citizen.



The integration of careers throughout the CTS program helps students make effective career decisions and target their efforts. Students in CTS will have the opportunity to expand their knowledge about careers, occupations and job opportunities and the education and/or training requirements involved. As well, they will recognize the need for lifelong learning.

Students in CTS will have the opportunity to use and apply technology and systems effectively and efficiently, which involves:

- a decision regarding which processes and procedures best suit the task at hand
- the appropriate selection and skilled use of the tools or resources that are available
- an assessment of and management of the impact the use of the technology may have on themselves, on others and on the environment.



Integrated throughout CTS are employability skills, those basic competencies that help students develop their personal management and social skills. Personal management skills are improved as students take increased responsibility for their learning, design innovative solutions to problems or challenges, and manage resources effectively and efficiently. Students' social skills improve through learning experiences that require them to work effectively with others, demonstrate teamwork and leadership, and maintain high standards in safety and accountability.

Further enhancing the employability skills, CTS reinforces and enhances learnings developed in core and other complementary courses. The curriculum emphasizes, as appropriate, the effective application of communication and numeracy skills.

Finally, in addition to the common outcomes described above, those students who focus on a particular area of study will develop career-specific competencies that support entry into the workplace and/or related post-secondary programs. Career-specific competencies can involve understanding and applying appropriate terminology, processes and technologies related to a specific career, occupation or job.

GENERAL LEARNER EXPECTATIONS

General learner expectations describe the basic competencies that are integrated throughout the CTS program.

Within an applied context that is relevant to personal goals, aptitudes and abilities, the student in Career and Technology Studies will:

- demonstrate the basic knowledge, skills and attitudes necessary for achievement and fulfillment in personal life
- develop an action plan that relates personal interests, abilities and aptitudes to career opportunities and requirements
- use technology effectively, linking and applying available tools, management and processes to produce a desired outcome
- develop personal management skills by:
 - linking theory and practice, using resources, tools, technology and processes responsibly and efficiently (managing learning)
 - applying effective and innovative decision-making and problem-solving strategies in the design, production, marketing and consumption of goods and services (being innovative)
 - selecting relevant, goal-related activities, ranking them in order of importance, allocating necessary time, and preparing and following schedules (managing resources)
- improve social interaction skills by:
 - demonstrating flexibility and cooperative work and communication behaviors (working with others)
 - participating as a team member by working cooperatively with others and contributing to the group with ideas, suggestions and effort (teamwork and leadership)
 - demonstrating high standards of diligence, attendance and punctuality, following safe procedures consistently, and recognizing and eliminating potential hazards (demonstrating responsibility)
- demonstrate appropriate verbal, written, composition, summarization and presentation skills
- use basic computation and measurement principles accurately and efficiently.

PROGRAM ORGANIZATION

CURRICULUM STRUCTURE

Career and Technology Studies is organized into *strands* and *modules*.

Strands in CTS define competencies that help students:

- build daily living skills
- investigate career options
- use technology (managing, processes, tools) effectively and efficiently
- prepare for entry into the workplace and/or related post-secondary programs.

In general, strands relate to selected industry sectors that offer positive occupational opportunities for students. Some occupational opportunities require further education after high school, and some allow direct entry into the workplace. The industry sectors encompass both goods-producing industries, such as agriculture, manufacturing and construction, and service-producing industries, such as business services, health services, and finance and insurance services.

Modules are the building blocks for each strand. They define what a student is expected to know and be able to do (exit-level *competencies*). Modules also specify prerequisites and facility and instructional parameters, where necessary.

The competencies a student must demonstrate to achieve success in a module are defined through the *module learner expectations*. Senior high school students who can demonstrate the module learner expectations (i.e., have the designated competencies) will qualify for one credit towards their high school diploma.

Module learner expectations are a culmination of the *specific learner expectations*, which provide a more detailed framework for instruction. They define the scope and depth of knowledge, skills and attitudes the student should acquire.

The following chart shows the 21 strands that comprise the CTS program and the number of modules available in each strand.

Strand	No. of Modules
1. Agriculture	31
2. Career Transitions	13
3. Communication Technology	32
4. <i>Community Health</i>	25*
5. Construction Technologies	46
6. <i>Cosmetology</i>	64*
7. Design Studies	31
8. <i>Electro-Technologies</i>	33*
9. <i>Energy and Mines</i>	27*
10. Enterprise and Innovation	8
11. <i>Fabrication Studies</i>	39*
12. <i>Fashion Studies</i>	37*
13. Financial Management	15
14. Foods	37
15. Forestry	21
16. Information Processing	43
17. Legal Studies	13
18. <i>Management and Marketing</i>	26*
19. <i>Mechanics</i>	49*
20. Tourism Studies	24
21. Wildlife	17

*Estimate

Note: As of September 1994, 13 of the 21 strands are available for optional implementation in Alberta junior and high schools. The remaining strands, indicated above in italics, will be phased in from September 1995 to September 1996. Provincial implementation of all strands is scheduled for September 1997.

LEVELS OF ACHIEVEMENT

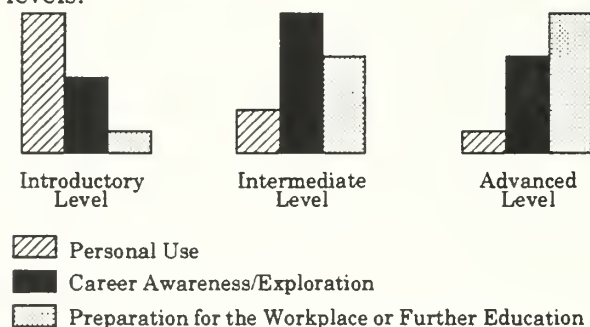
Modules are organized into three levels of achievement: introductory, intermediate and advanced. As students progress through the levels, they will be expected to meet higher standards and demonstrate increased degree of competence, both in the general learner expectations and the module learner expectations.

Introductory level modules help students build daily living skills and form the basis for further learning. Introductory modules are developed for students who have no previous experience in the strand.

Intermediate level modules build on the competencies developed at the introductory level. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

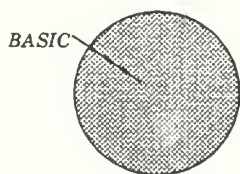
Advanced level modules demand a higher level of expertise and help prepare students for entry into the workplace or a related post-secondary program.

The following illustrates the relative emphasis on the aspects of career planning at each of the levels.



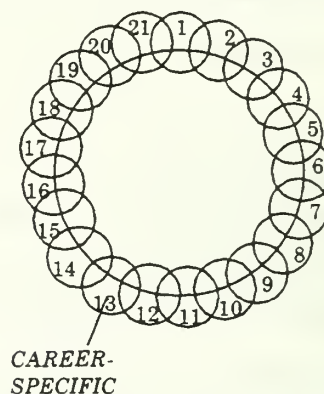
TYPES OF COMPETENCE

Two types of competence are defined within the CTS program: basic and career-specific.



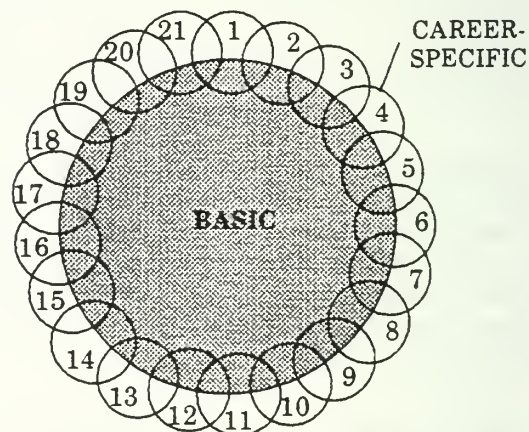
Basic Competencies are generic to any career area and are developed within each module. Basic competencies include:

- personal management; e.g., managing learning, being innovative, ethics, managing resources
- social; e.g., communication, teamwork, leadership and service, and demonstrating responsibility (safety and accountability).



Career-specific Competencies relate to a particular strand. These competencies build daily living skills at the introductory levels and support the smooth transition to the workplace and/or post-secondary programs at the intermediate and advanced levels.

The following model shows the relationship of these two types of competencies within the 21 strands of CTS (numbers refer to the chart on page A.5):



CURRICULUM AND ASSESSMENT STANDARDS

CURRICULUM STANDARDS

Curriculum standards in CTS define what students must know and be able to do. Curriculum standards are expressed through general learner expectations for CTS, and through module and specific learner expectations for each strand.

ASSESSMENT STANDARDS

Assessment standards define how the student's performance will be judged. In CTS, each assessment standard defines the conditions and criteria to be used for assessing the competencies defined in each module learner expectation. Students must fully meet each assessment standard, including all of the criteria and conditions defined for the module. Assessment standards are in draft form, as are tools and weightings, and will be validated 1994-97.

Teachers throughout the province will be able to ensure students receive a fair and reliable assessment. Students will use the assessment standards to guide their efforts, ensuring they participate more effectively and successfully in the learning and assessment process. Standards at advanced levels are as much as possible linked to workplace and post-secondary entry-level requirements.

The following pages describe the Design Studies strand in the Career and Technology Studies program.

DESIGN STUDIES

STRAND RATIONALE

Design is an integral part of our society. It permeates every facet of civilization, sometimes in complex ways, many times quite simply. Everyone designs every day. Design brings a sense of order to our world. Young children in play design physical structures, visual images and systems of organization. Professional designers create these and many other things. Signs, displays, packages, road systems, computer games, furniture, automobiles, clothing, banquets, houses and highrises are a few examples of work produced by professional designers.

Students may not become “professional designers”, but they still engage in design in some way. Design Studies helps students become aware of design in their environment, engages them in “designing”, and shows them how design processes may be used in many contexts. Being aware of and appreciating the importance of design helps students become effective members of society.

Design can be described as a “creative problem-solving process, which begins with identifying a specific human need and results, ideally, in a product or situation that improves or enhances some aspect of our lives.”★ Design can be both a noun and a verb. As a noun, design can describe a condition, as in the statement “... your design shows creativity.” As a verb, design suggests a process or problem-solving activity, as in the

statement “...I need to design a container to carry water.” Design Studies students work primarily in the context of design as a verb.

All students are expected to develop problem-solving skills through their school experience. Design Studies deals specifically with solving problems in a variety of contexts, and is limited only by facility or imagination. Design Studies students may be expected to solve visual problems, structural problems and organizational problems using the context of their environment, their other classes and their community experiences. This ability to solve problems will be applied by Design Studies students to situations in their daily lives, in their workplace activities and in post-secondary studies. The theoretical and practical learning of processes, tools and technologies used during Design Studies is relevant, because the learning occurs in context.

There are many reasons for students to engage in Design Studies. For example, students may wish to:

- develop and apply creative abilities and aesthetic awareness
- develop investigative and research skills
- develop problem-solving abilities

★ Definition taken from *What Is Design?* Edmonton, Alberta Alberta Culture and Multiculturalism.

- develop the ability to select an appropriate medium, model a solution and effectively communicate the solution to others
- recognize the importance of design in the human environment and its impact upon the natural environment
- appreciate the relationship between aesthetics, function, materials and processes
- become aware of the many factors that have to be taken into account in order to achieve appropriate and effective design solutions
- use appropriate technology to arrive at design solutions
- create innovative approaches, products and systems
- recognize significant historical events in design and how they have influenced subsequent design developments
- be better able to pursue a design career.

Design may be studied in its own right or it may be incorporated into other curricula. Key features of Design Studies and other design-based programs are to:

- encourage and facilitate students to be creative, innovative and curious
- teach students to identify and solve many different kinds of design challenges
- incorporate student-directed learning
- teach teamwork strategies and skills
- apply theory within a context
- use technology appropriately and effectively
- teach safe and effective work practices
- appreciate appropriate attitudes such as pursuing and valuing quality, ethics, professionalism, attention to detail, perseverance, and understanding the discipline of design

- encourage cross-curricular links
- reach beyond the school to the community, to create links, projects and contacts with designers, local groups, professionals and businesses.

Within the philosophy of Career and Technology Studies (CTS), students in Design Studies *will*:

- demonstrate creativity and innovation
- demonstrate aesthetic awareness
- use historical research as one basis for design activity
- identify and solve problems
- work in two and three dimensions
- work individually and as a team member
- recognize the value of technology and use it appropriately and effectively
- demonstrate and practise safe and effective work habits and attitudes
- develop and apply personal and interpersonal, verbal and non-verbal communication and presentation skills
- develop the ability to recognize, appreciate and create appropriate design solutions
- appreciate that designers may confront ethical, legal and moral issues in their work
- appreciate that design has an impact upon the environment
- develop a working knowledge of tools, materials and processes associated with specific tasks
- develop and maintain a design journal
- develop and maintain a portfolio of design solutions.

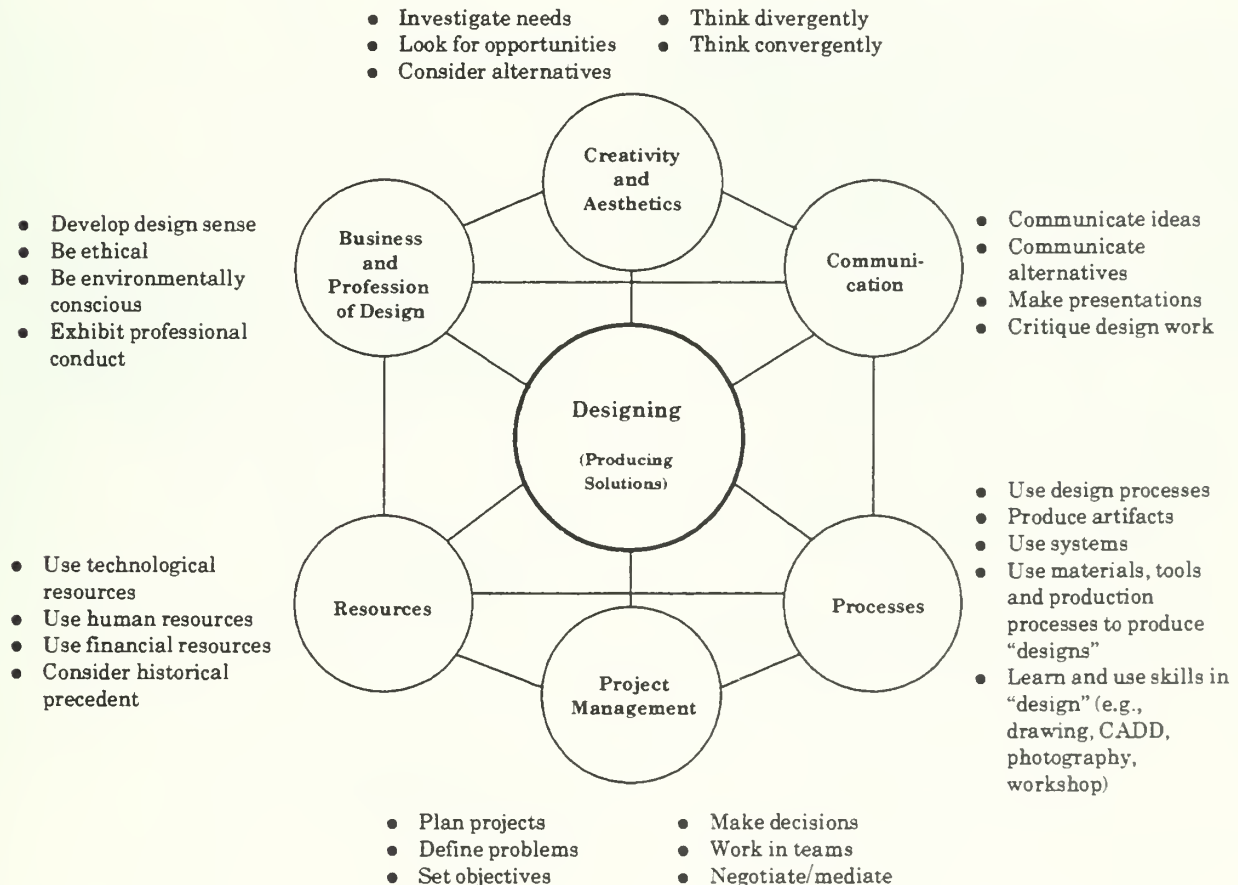
STRAND ORGANIZATION

Design and Design Studies centre around the activity of problem solving within constraints. Design is complex, requiring the designer to simultaneously bring together numerous bits of knowledge, various processes and a variety of skills, and to use them together to address the task at hand. Design Studies focuses on six major areas:

- communication
- project management
- business and profession of design.

The illustration below shows how these components interrelate.

- creativity and aesthetics
- processes
- resources



THEMES

Modules in Design Studies are divided into three themes. Each theme is based on commonalities within the topics covered by the modules within the themes. While these are convenient groupings, they should not be seen as exclusive as the modules from all themes complement each other. The three Design Studies themes are:

- design skills, processes and applications
- drafting for design and technical drawing skills
- business/issues/history.

CONCEPTS

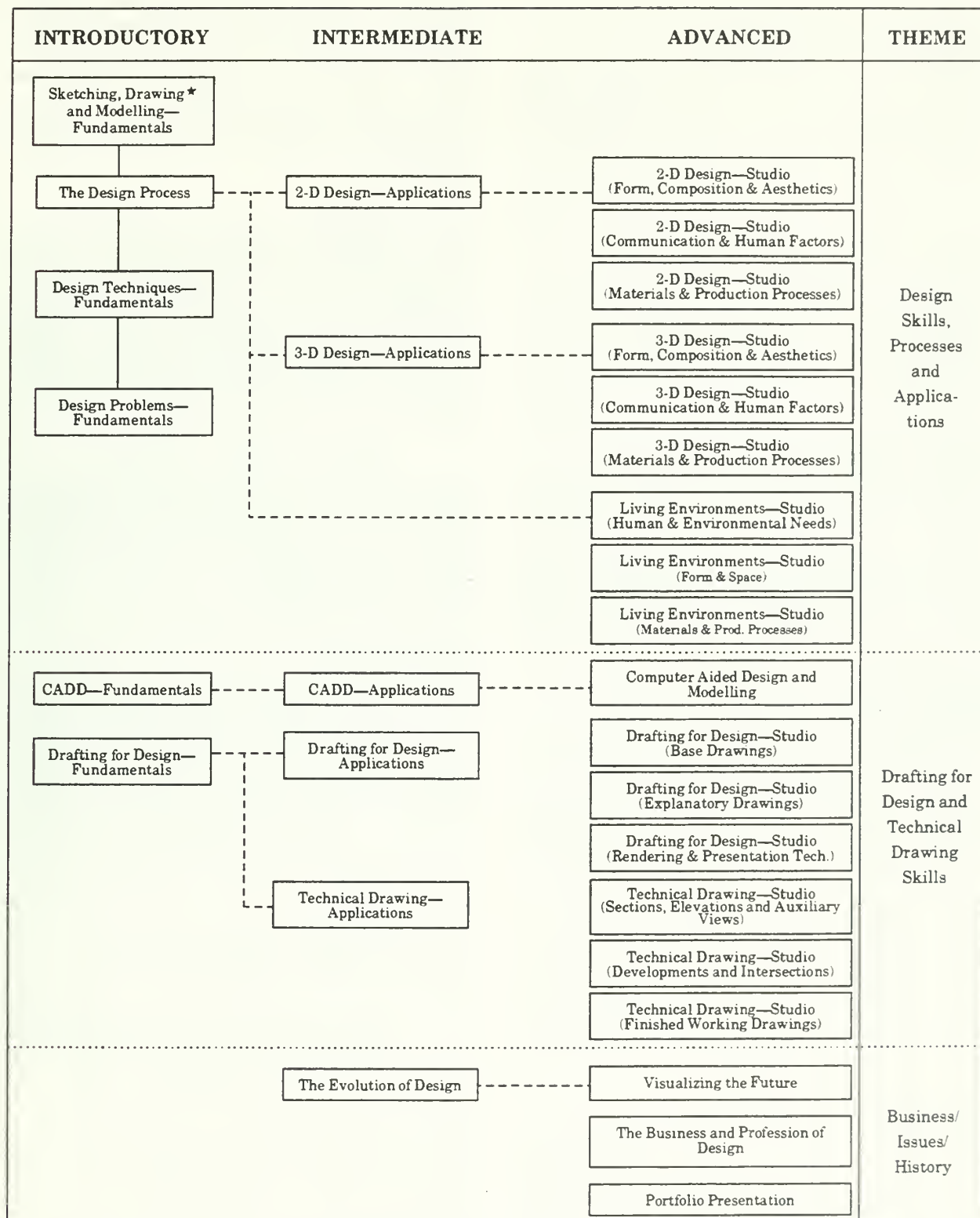
There are four common concept areas dealt with in Design Studies. Some are found in all modules while others relate most appropriately to specific modules. For example, design skills are more relevant in skills-based modules. The elements and principles of design and applied problem-solving are emphasized in process-based modules. The need to present work and/or information and maintain a design journal and portfolio is required in all modules.

The four concepts in Design Studies are:

- skills development
- elements and principles of design
- applied problem solving
- presentation, design journal and portfolio.

SCOPE AND SEQUENCE

DESIGN STUDIES



— Prerequisite

- - - Recommended prerequisite or corequisite

* Recommended prerequisite/corequisite for all other modules in the Design Skills, Processes and Applications, and Drafting for Design and Technical Drawing skills themes.

MODULE DESCRIPTIONS

Module DES101: Sketching, Drawing and Modelling—Fundamentals

Students are introduced to observational sketching and drawing, and modelling, and develop skills that can be used and enhanced in further design activity. Students are also introduced to a selection of materials and tools and their uses.

Module DES102: The Design Process

Design is a process-based activity. The student begins the process by developing an understanding of the problem through research. The student then develops possible solutions, working through them to arrive at a final appropriate solution.

Module DES103: Design Techniques—Fundamentals

This is a skill building module. Here the student develops skills and techniques appropriate to design through engaging in a variety of activities in various contexts. Techniques may include drawing, use of notation, use of tools and equipment, and layout, cutting, joining and measuring.

Module DES104: Design Problems—Fundamentals

In this module, students apply the design process (see the Design Process module) to solve a variety of two- and/or three-dimensional design problems, using techniques such as sketching, drawing and modelling, and other techniques learned in Design Techniques—Fundamentals.

Module DES105: CADD—Fundamentals

The ability to use a personal computer effectively is becoming essential in design. In this module, the student develops basic skills and knowledge in Computer Aided Design and Drafting (CADD).

Module DES 106: Drafting for Design—Fundamentals

This module concentrates on basic skill development. The student develops basic knowledge, skills and techniques of drafting appropriate for visualizing and illustrating simple design problems.

Module DES201: 2-D Design—Applications

Students apply the design process and other knowledge, skills and processes learned at the introductory level to projects in two-dimensional design. Projects in this module typically deal with communication problems and issues. Students take greater responsibility for managing their learning and work cooperatively with others.

Module DES202: 3-D Design—Applications

Students apply the design process and other knowledge, skills and processes learned at the introductory level to projects in three-dimensional design. Projects in this module typically deal with problems and issues related to product design. Students take greater responsibility for managing their learning and will work cooperatively with others.

Module DES203: CADD—Applications

Students apply their learning from CADD—Fundamentals, and add knowledge, skills and techniques associated with Computer Assisted Design and Drafting in the context of new design-related tasks.

Module DES204: Drafting for Design—Applications

Skills in assembly, section and/or auxiliary drawing are learned in this module. Students further develop the knowledge, skills and techniques learned at the introductory level in Drafting for Design Fundamentals (e.g., pictorial drawing, multiview drawing, surface developments [flat pattern for garments]) by applying them in the context of more complex design projects.

Module DES205: Technical Drawing—Applications

Students develop accurate multiview drawings from previously produced sketches, and learn the common understandings, conventions and language associated with technical drawing.

Module DES206: The Evolution of Design

Student develop a historical framework for the importance and relevance of design within a cultural context by examining past and contemporary examples of designed artifacts.

**Module DES301: 2-D Design—Studio
(Form, Composition and Aesthetics)**

The student applies the theories, skills and techniques of organization of the visual image onto the two-dimensional format, to resolve complex design problems. Emphasis is placed on exploring form, composition and aesthetics within appropriate communication design solutions.

**Module DES302: 2-D Design—Studio
(Communication and Human Factors)**

The student investigates the impact, importance and influence of two-dimensional design within a cultural context and the social responsibility of the designer, and applies this information when resolving complex communication design problems.

**Module DES303: 2-D Design—Studio
(Materials and Production Processes)**

The student explores the production processes of two-dimensional design and the role of the designer as an organizer of appropriate materials, processes and systems. This understanding is applied by the student in the resolution of complex two-dimensional design problems.

**Module DES304: 3-D Design—Studio
(Form, Composition and Aesthetics)**

Students deal with such aspects as shaping, massing, proportion, scale, contrast, colour, texture and finish within the context of complex three-dimensional design projects.

**Module DES305: 3-D Design—Studio
(Communication and Human Factors)**

Students are introduced to human factors and considerations in designed artifacts, including ergonomics, semantics and semiotics.

**Module DES305: 3-D Design—Studio
(Materials and Production Processes)**

Students expand their knowledge of the materials used for the production of products, and the technologies and production processes employed to shape and join materials and to assemble products. They become familiar with the principles of manufacturing, and the materials, technologies and processes appropriate for manufacturing a product in various production quantities.

**Module DES307: Living Environments—
Studio (Human and Environmental Needs)**

The student learns to develop appropriate design solutions for specific human needs through architectural, environmental or interior design. The student learns to utilize design methodology and teamwork in the development of these solutions.

**Module DES308: Living Environments—
Studio (Form and Space)**

The student learns to consider form and space when developing specific architectural, environmental or interior design solutions specific to human and/or environmental needs. The student assesses solutions on the basis of functional and aesthetic considerations and appropriateness within the human environment. Materials and production processes may be considered at this stage though not necessarily resolved. When designing at the micro level, students consider the ergonomic aspects of design.

**Module DES309: Living Environments—
Studio (Materials and Production
Processes)**

The student develops design solutions specific to architectural, environmental or interior design; learning about, utilizing and/or specifying appropriate materials and production processes.

**Module DES310: Computer Aided Design
and Modelling**

Students solve design problems using advanced Computer Aided Design and Drafting (CADD) methods, utilizing advanced commands, three-dimensional modelling techniques, rendering, shading and animation techniques.

**Module DES311: Drafting for Design—
Studio (Base Drawings)**

Students concentrate on various drawing and drafting types to illustrate design concepts and solutions. These might include freehand drawings, illustrative views, isometric drawings, perspective drawings, axiometric drawings, surface developments (flat pattern). This is a skill-building module with the emphasis on line drawing. **Note:** Completed drawings from this module may be used as preparatory material for subsequent Drafting for Design—Studio or Technical Drawing—Studio modules.

Module DES312: Drafting for Design Studio (Explanatory Drawings)

Complex explanatory drawings are developed from base (line) drawings, including exploded views, cut-aways, revolutions, sectional, and shadow and reflection construction. Further development of drawings and/or drawing types begun in Drafting for Design—Studio (Base Drawings) may also be included. This is a skill-building module with the emphasis on explanatory line drawings.

Module DES313: Drafting for Design Studio (Rendering and Presentation Techniques)

Rendering techniques are applied to line drawings (base or developed), with attention to light, colour and various media (coloured pencils, marker pens, water colours, computer rendered, etc.). Emphasis is on rendering.

Presentation techniques are used to compose high quality illustrations to communicate design solution, using rendered drawings, context backgrounds, collage and montage techniques, titles, text, etc. Emphasis is on visual presentation.

Module DES314: Technical Drawing—Studio (Sections, Elevations and Auxiliary Views)

Students build upon their learning from the intermediate level. They may use previously produced sketches and multiview drawings as a basis for further work. The focus of this module is on the production of sections, elevations and auxiliary drawings.

Module DES315: Technical Drawing—Studio (Developments and Intersections)

Within fabrication, manufacturing and/or construction there is a need to clearly identify and specify details of various product components. Students focus on representations of developments (e.g., sheet metal flashing, clothing patterns) and intersections (e.g., the intersection of two heating ducts).

Module DES316: Technical Drawing—Studio (Finished Working Drawings)

Working drawings are required to clearly diagram and illustrate the design specifications for a product, structure and/or process. They provide the basis for fabrication, manufacturing and/or construction. Students complete a set of working drawings for a self-generated or teacher-specified designed item.

Module DES317: Visualizing the Future

What will the role of the designer be in the future? What challenges will designers face? Students explore new possibilities in design through this module.

Module DES318: The Business and Profession of Design

Student develops an understanding of the business aspect of the design profession including educational qualifications, opportunities in design and some of the issues and challenges designers face. Ethical, legal and social issues may be explored in this module.

Module DES319: Portfolio Presentation

Students taking this module prepare a portfolio for a specific purpose such as entry into the workplace or a post-secondary institution.

PLANNING FOR INSTRUCTION

CTS provides increased opportunity for junior and senior high schools to design courses based on the needs and interests of their students and the circumstances within the school and community. Some strands may be appropriately introduced at the junior high school level. Other strands are more appropriately introduced at the senior high school level or to Grade 9 students. Refer to page C.2 of this Guide for recommendations regarding Design Studies strand, or the *CTS Manual for Administrators, Counsellors and Teachers* for a summary of the recommended grade levels for each strand.

PLANNING FOR CTS

Defining Courses

Schools determine which strands and modules will be offered in a particular school, and will combine modules into courses.

Each module was designed for approximately 17 to 25 hours of instruction. However, this time frame is only a guideline to facilitate planning. The CTS curricula are competency based, and the student may take more or less time to gain the designated competencies within each module.

A course will usually consist of modules primarily from the same strand but, where appropriate, may include modules from two or more strands. Refer to the *CTS Manual for Administrators, Counsellors and Teachers* for more information on course names and course codes.

Module selection and sequencing must consider the module parameters, which define:

- prerequisites and corequisites (entry-level competencies)
- instructional qualifications, if specialized
- equipment and facility requirements, if specialized.

The module parameters are defined for each module in Sections D, E and F of this Guide.

Degree of Flexibility

The CTS program, while designed using the modular structure to facilitate flexible time tabling and instructional delivery, does not mandate the degree of flexibility a school or teacher will offer. The teacher and school will determine the degree of flexibility available to the student. Within the instructional plan established by the school, the student may:

- be given the opportunity to progress at a rate that is personally challenging
- have increased opportunity to select modules that develop competencies he or she finds most relevant.

Integrating Basic Competencies

Basic competencies are also developed throughout the CTS program and within each CTS module. Selected basic competencies will be emphasized within a module, depending on the nature of the career-specific competencies defined for the module.

Refer to the Assessment Tools section of this Guide for the description of student behaviours expected at each of the three developmental levels defined for the basic competencies.

Assessment of basic competencies could include input and reflection from the student, teacher, peers and workplace supervisors. Description of the observed behaviour could be provided through a competency profile for the module. Positive, ongoing interaction between the student and teacher will support motivation for student growth and improvement.

No mark would be assigned to the student's performance in the designated basic competencies, although a description of the level of performance should be included within the assessment of each module.

Assessing Student Achievement

Assessing the student's competency is a process of gathering information by way of observations of process, product and student interaction.

Where appropriate, assessment tools have been defined to assist the teacher and student in the assessment. Refer to the Assessment Tools section of the Guide to Standards and Implementation for copies of the various tools (worksheets, checklists, sample questions, etc.).

The relative weighting, or emphasis, for each assessment standard has also been established. The weighting is a guideline to help teachers determine a percentage grade for students.

Recognizing Student Achievement

At the high school level, successful demonstration of the exit-level competencies in a module qualifies the student for one credit. Refer to Section A for more detailed information about how curriculum and assessment standards are defined in CTS. Refer to the *CTS Manual for Administrators, Counsellors and Teachers* for more information on how student achievement can be recognized and reported at the school and provincial levels.

Resources

A comprehensive resource base, including print, software and audio-visual, has been identified to support the Design Studies strand. It is intended that these resources will form the basis of a resource entre, encouraging teachers and students to access a wide selection of resources and other information sources throughout the learning process. Unless otherwise noted, these resources are considered to be suitable for both junior and senior high school students.

Authorized resources may be obtained from the Learning Resources Distributing Centre or directly from the publisher or distributor. Refer to the Learning Resources section of this Guide for the complete resource list including curriculum correlations and resource annotations. Additional sources refer to non-commercial or government agencies that offer resources that may be of assistance in this strand.

In addition to the resources, sample Student Learning Guides/Integrated Projects are available for some modules in Design Studies. These samples, designed for individual student or small group use, provide an instructional plan

for selected modules and include the following components:

- Why take this module?
- What are the entry-level competencies?
- What are the exit-level competencies?
- What resources may be accessed?
- What assignments/activities must be completed?
- What are the time lines?
- How will the final mark be calculated?

Copies of these samples can be obtained, by request, from the CTS Unit in print and/or disk format (Microsoft Word).

PLANNING FOR DESIGN STUDIES

The following suggestions are provided to assist teachers and school and school system administrators as they plan to deliver modules from the Design Studies strand.

Selecting Modules

The scope and sequence chart, page B.3, provides an overview of the Design Studies modules, indicating prerequisites and theme areas. Brief descriptions of the modules are on pages B.4 to B.6.

Design Studies has been developed for both junior high and senior high school students. The Design Studies modules may be offered in a variety of contexts, depending on local need and on the human and physical resources available in the school and community. The curriculum has been designed so that individual modules or clusters of modules can be offered. Some schools may wish to concentrate on the two-dimensional design modules while others will prefer to offer the modules in three-dimensional design or drafting for design or technical drawing. Each module has a value of 1 credit, so clustering may occur in traditional 3- or 5-credit units or in other configurations.

Not all schools will want to offer a full Design Studies program. Courses may be constructed by using only Design Studies modules or by combining Design Studies modules with modules from other CTS strands.

Sample

An example of a 3-credit Design Studies course is:

MODULES
<ul style="list-style-type: none">● Sketching, Drawing and Modelling—Fundamentals● The Design Process● Drafting for Design—Fundamentals
RATIONALE/LEARNINGS
<p>Students have the opportunity to learn a process of “design” (through experiences in two- and three-dimensional design), basic visualization skills (through sketching and drawing) and several basic drafting styles and techniques (pictorial drawing and multiview drawing).</p> <p>This course complements the visual arts and science programs and other CTS strands. Students use various basic tools and materials in several contexts.</p>

Planning for Instruction

Design Studies has three levels of complexity: introductory, intermediate and advanced. There is appropriate rigour throughout all levels of the program with greater expectations placed on students as they progress. This rigour is determined by the complexity of the tasks and projects they engage in, the degree of background knowledge and skills they must bring to the task and the degree of personal responsibility expected of students.

Design at all levels requires creativity, perseverance, technical skills and knowledge and an understanding of and ability to use process. This does not mean that students are expected to have all of these attributes when they enter the introductory level. These attributes must be taught to students and developed over time. It is unfair to expect students to be able to produce designed solutions to problems without having the necessary

prerequisites. Teachers must teach the necessary skills and knowledge at each level required by the tasks they assign. Students should be expected to apply learned knowledge and skills to future tasks and to add new learning through this process.

The information presented here provides an overview of program expectations to guide your instruction. It gives you a sense of the scope of the Design Studies program, its direction and what should be expected of students at each program level. Expectations for each module are found within the modules themselves along with criteria to guide assessment.

Introductory Level (Fundamentals)

The introductory level of Design Studies is characterized by the term “fundamentals” and as such provides basic skills and knowledge to students that they use and add to at succeeding levels. Depending on the modules taken, students successful at the introductory level should be able to do the following:

- look at simple objects and draw them freehand with reasonable accuracy
- draw simple objects and common geometric forms with the aid of mechanical instruments and/or a computer
- recognize the steps of a design process (design loop) and be able to identify them
- solve simple pre-set problems by following a design process
- use basic techniques common to two- and three-dimensional design such as measuring, cutting, pasting, joining
- recognize and use some of the elements (e.g., line, shape/form, space) and principles (e.g., balance, proportion, emphasis) in their work.

At the introductory level students must be taught how to draw, how to use common instruments (including a computer for Computer Aided Design and Drafting (CADD) where applicable) and how to problem solve. Where teachers begin with this teaching depends on their student(s). For some students, drawing begins with learning to hold a pencil properly, so the introduction to CADD will begin with locating the power switch on the computer. Other students will come equipped with a

battery of skills that allow teachers to begin instruction at a more advanced level.

Where problem solving is concerned, students should be presented with simple challenges of short duration which allow them to repeat the design process over and over again with teacher guidance. Providing students with a complex challenge that takes a long time to complete discourages the students and also provides limited experience with the process. Designing is like swimming in that the basic skills are learned in the safety of shallow water and then applied in more challenging environments as the swimmer's ability and confidence increases. In design, students need to solve a series of simple problems then move onto more complex challenges as their abilities develop.

Intermediate Level (Applications)

Students who successfully complete intermediate level modules should be able to demonstrate what they learned at the introductory level (basic skills and knowledge from the modules they took) plus they should be able to use these skills and knowledge to complete assigned tasks independent of teacher direction. For example, students who completed all introductory level modules should be able to do the following:

- draw a simple object freehand
- produce a pictorial drawing of an object using an isometric grid
- accurately measure the distance between two points
- brainstorm five potential solutions to a simple design challenge
- other requirements specific to the modules taken; e.g., demonstrate basic CADD operations.

Specific skill and knowledge development at the intermediate level centres around the following:

- broadening the recognition and use of the elements and principles of design in many design contexts
- refining previously developed skills and learning new skills in two- and three-dimensional design specific to the assignments given

- producing additional styles of pictorial drawings
- producing multiview drawings for defined purposes (e.g., house plans, machined tools) and accurately dimensioning them
- further developing computer skills as they apply to CADD
- obtaining a rudimentary understanding of the history of design
- other requirements specific to the modules taken.

Teachers should expect students who have completed three or more intermediate level modules to be able to assume greater responsibility for their learning where they have been taught the prerequisite skills and knowledge. This responsibility may appear in the student's ability to make rational decisions and to act on their decisions. It is not good enough for a student to just be able to demonstrate a particular skill if the teacher must continually guide the student throughout the task. Given a straightforward task (e.g., design a poster to advertise a school dance, design a bus shelter, design a tooth brush and produce a model) intermediate level students should be able to take on the task and complete it. They should be able to plan their project, select and use appropriate materials, tools and equipment (safely and within established guidelines), manage their time and activities, and present their work at any stage of development. The introduction of new knowledge and skills and associated materials, tools, processes, procedures, or specific requirements can be the focus of new teaching.

Advanced Level (Studio)

The notion of "studio" presents the opportunity for students to work with greater independence from direct instruction so they can solidify previous learning and experiment with new ideas. It has been adopted by Design Studies to signify the advanced level of the strand. The areas of two- and three-dimensional design, CADD, drafting for design, technical drawing and history have been carried forward from previous levels. The additional foci of living environments (e.g., interior, environmental and architectural design), the business and profession of design and preparation of a polished portfolio for presentation to potential clients,

employers or post-secondary institutions are found at this level.

Students at the advanced level should be able to demonstrate skills and knowledge developed at the introductory and intermediate levels based on the modules taken. In addition, they should be able to:

- take on a project of greater complexity and work it through to a successful conclusion with very limited teacher direction
- work successfully as a member of a design team and take on various roles as required
- develop additional skills specific to CADD particularly computer modelling
- develop skills in rendering and explanatory drawing and use these to explore, explain and illustrate design concepts and ideas as required within a project
- prepare a variety of technical working drawings (detail and assembly drawings), including sections, elevations, auxiliary views, developments and intersections based on the projects assigned
- demonstrate an understanding of the history of design and be able to suggest future directions in at least one area of design
- identify different opportunities in the business and profession of design and how those opportunities may be taken advantage of
- produce a portfolio suitable for presentation to a potential employer, post-secondary design school or potential client
- other requirements specific to the modules taken.

The Design Process Overview

Fundamental to all design is the recognition and application of process. Some models describe design as a linear process beginning with the identification of a problem to be solved and ending with the evaluation of a “designed” solution. Other models identify a series of steps on a circle beginning with problem identification and evolving to a “designed” solution which may spawn a new problem, continuing the cycle. Current thought recognizes design as an iterative★ process, which may begin with an

identified problem and evolve to a “designed” solution through a process that may require the designer to repeat the same steps several times over, each time getting closer to a finished design. Recognizing the nature of design and being able to apply the process of design in many contexts is the basis of Design Studies.

Three introductory level modules provide basic instruction in the design process. These modules illustrate the process of design, explore some fundamental techniques used in the context of two- and three-dimensional design and provide an opportunity for students to engage in a series of design problems where they can be guided through the application of both process and technique.

Modules:

- The Design Process
- Design Techniques—Fundamentals
- Design Problems—Fundamentals

Two-dimensional Design and Three-dimensional Design Overview

Designers working in two dimensions (2-D) are primarily concerned with surface design while those working in three dimensions (3-D) are more interested in the structure and form of the design. 2-D and 3-D design can take many forms and often overlap. For example, some 2-D designers may design printed communication such as books, posters or brochures while 3-D designers may design furniture, tooth brushes or children's toys. Other 2-D designers may create signs for buildings and vehicles, credits for television and film or charts and graphs for year end reports. The 3-D designer may design buildings, televisions, cars or clothing. Some designers combine 2-D and 3-D in product packaging, in museum or retail display or in fabrics or wall coverings for personal living, public or commercial spaces.

The 2-D and 3-D Design—Applications modules at the intermediate level and the respective advanced level studio modules allow students to develop and enhance basic 2-D and 3-D design skills and knowledge learned in the introductory Design Studies modules. Specific learnings are

★ Iterative: repeating; full of repetitions. *Gage Canadian Dictionary*, 1983.

determined by the design tasks engaged in, particularly at the intermediate level. Each advanced level studio module has a specific focus that will guide the design considerations in that module.

Modules:

- 2-D Design—Applications
- 3-D Design—Applications
- 2-D Design—Studio (Form, Composition and Aesthetics)
- 2-D Design—Studio (Communication and Human Factors)
- 2-D Design—Studio (Materials and Production Processes)
- 3-D Design—Studio (Form, Composition and Aesthetics)
- 3-D Design—Studio (Communication and Human Factors)
- 3-D Design—Studio (Materials and Production Processes)

Living Environments Overview

Living Environments modules focus on architecture, interior design and environmental design. The spaces in which people live and interact are extremely important to their well-being. If a house, apartment or condominium meets the need of the people living in it, then it is of value. If a park or playground is well designed, it will offer its users many enjoyable hours and will be an asset to a community or location. Conversely, if the physical restrictions of a commercial space prevent effective commerce from occurring, the occupant will soon be out of business. The Living Environments modules put in context the knowledge and skills gained in other design modules in a specific application. As with the other advanced level Design Studies modules, each module provides a specific focus or point of reference for learning.

Modules:

- Living Environments—Studio (Human and Environmental Needs)
- Living Environments—Studio (Form and Space)
- Living Environments—Studio (Materials and Production Processes)

CADD Overview

Computers are playing an increasingly important role as a tool for design. It must be stressed, however, that the ability to design, and the ability to operate a computer-based “design” tool (e.g., CADD system, drawing or paint programs, desktop publishing programs) are not the same thing.

Successful designers in all likelihood are able to use the computer and peripheral technology (e.g., scanners, plotters, modems) with the same ease and effectiveness as they use a pencil, camera, model making material or a telephone. Although the computer can remove much of the repetitive labour-intensive aspects of design, freeing the designer to explore a greater number of ideas and potential design solutions, it is only one of many tools at the designer’s disposal.

The CADD modules concentrate on teaching skills and techniques specific to the software and hardware available. These modules will need to be complemented with other Design Studies modules where the skills can be applied, reinforced and enhanced and/or with skills-based or process-based modules from other strands (e.g., keyboarding modules from Information Processing, process-based modules from Communication Technology or Construction Technologies).

Modules:

- CADD—Fundamentals
- CADD—Applications
- Computer Aided Design and Modelling

Drafting for Design Overview

The ability to observe reality and represent it in a drawing is an essential skill for designers. While most design students use this skill as a vehicle for representing and communicating ideas and for clarifying design problems, students who excel in drawing may go on to become artists and illustrators. The drawing and modelling component of Design Studies begins with developing a range of observational drawing and modelling skills and augments these with specific techniques and drawing styles commonly associated with “drafting”. These techniques and drawing styles are used to visualize and clarify designs as they are

developed (e.g., isometric projections of different designs being considered for a chair, hair dryer or wind surfer, floor plans for a cottage, commercial outlet, kitchen renovation). The Drafting for Design modules emphasize the visual representation of design projects that are accurate in scale and proportion to the finished product. They differ from Technical Drawing modules, which emphasize the production of multiview, detail and assembly drawings and include dimensioning, specifications and conventions required for the fabrication, manufacture and/or construction of the project.

Each drawing module emphasizes specific learnings such as different drawing styles and terminology (e.g., sketching and base drawings), specialized drawings and their use in illustrating particular design ideas (e.g., the cross-section of a running shoe to show the various layers of the sole) and particular illustrative techniques (e.g., rendering techniques). The competencies attained through the modules at each level form the basis for the next higher level. These learnings are reinforced through their application in other design process modules and are augmented through the more specific focus of the Technical Drawing modules at the intermediate and advanced levels.

Note: Please refer to the CADD Overview and the Note in the Technical Drawing Overview.

Modules:

- Sketching, Drawing and Modelling—Fundamentals
- Drafting for Design—Fundamentals
- Drafting for Design—Applications
- Drafting for Design—Studio (Basic Drawings)
- Drafting for Design—Studio (Explanatory Drawings)
- Drafting for Design—Studio (Rendering and Presentation Techniques)

Technical Drawing Overview

Technical drawings are required to clearly communicate specifications for fabrication, manufacturing and/or construction. In the Technical Drawing—Applications and Studio modules, students develop working drawings based on design sketches of varying complexity.

These are skill-development modules and support the more process-based modules in the strand. They differ from the Drafting for Design modules in that the products of these modules are detailed working drawings, accurately dimensioned and reflecting the codes, standards and conventions required by the project being drawn.

Each technical drawing module emphasizes specific learnings (e.g., basic technical drawing styles, terminology, and conventions, dimensioning and notation, specialized technical drawings). These are learned within the context of drawing tasks assigned. Students attaining the competencies in the intermediate level module learn technical drawing skills that they can apply in detailing their design work. Students completing all four technical drawing modules, in combination with other Design Studies modules develop specific skills, recognize the use of different types of technical drawings and are able to produce appropriate drawings as required in the context of various design projects.

Note: The tools used to complete these modules may vary depending on what is available to teachers and students. The modules have been written so that students with access to CADD systems or to traditional tools (e.g., drawing tables, drafting machines) can be equally successful. However, CADD is quickly becoming the standard in most post-secondary and industrial settings.

Modules:

- Technical Drawing—Applications
- Technical Drawing—Studio (Sections, Elevations and Auxiliary Views)
- Technical Drawing—Studio (Developments and Intersections)
- Technical Drawing—Studio (Finished Working Drawings)

Business, Issues and History Overview

Design as a profession forms the basis for many business enterprises. Wherever new products or applications are being developed or new ways of doing things are being conceived, the design process is occurring and professional designers are often involved. Two of the four modules within the Business, Issues and History theme of

Design Studies provide students with an overview of design as it has evolved over time. Different avenues of design and examples of work (e.g., the evolution of buildings, posters, shoes, cars, telephones, materials such as plastics, processes such as types of energy generation) may form the basis for these modules.

One module looks at the business of design including the wide variety of career options and employment opportunities available to students. Students are expected to investigate the degree and type of training required to enter their chosen field. For students planning on pursuing a career in design, the preparation and presentation of a portfolio is extremely important. This is the focus of the final module in this section.

Modules:

- The Evolution of Design
- Visualizing the Future
- The Business and Profession of Design
- Portfolio Presentation

Identifying Linkages

Refer to Section H of this Guide for CTS modules that enhance the learnings defined in Design Studies. As well, linkages to other complementary and core programs are described. Design Studies links with the current Drafting 12, 22, 32 program. Please see Section H for details.

Note that project modules from the Career Transitions strand may be combined with modules from Design Studies to provide increased opportunity for students to develop expertise and refine their competencies.

Improving Smooth Transitions to the Workplace and/or Post-secondary Programs

The potential transitions students may make into related post-secondary programs or other avenues for further learning as described in Section H of this Guide.

MODULE CURRICULUM AND ASSESSMENT STANDARDS

INTRODUCTORY LEVEL

The following pages define the curriculum and assessment standards for the introductory level of Design Studies.

Introductory level modules help students build daily living skills and form the basis for further learning. Introductory modules are developed for students who have no previous experience in the strand.

Module learner expectations define the competencies a student must demonstrate to achieve success in a module. Assessment standards define the conditions and criteria to be used for assessing the competencies defined in the module learner expectations. These assessment standards and the accompanying assessment tools are in draft form and will be validated from 1994 to 1996.

Specific learner expectations provide a detailed framework for instruction and help students build the competencies defined in the module learner expectations. Additional information and suggestions for instruction are provided in the Notes column; teachers may wish to use this space to record their ideas for instruction or student projects.

Module DES101:	Sketching, Drawing and Modelling—	D.3
	Fundamentals	
Module DES102:	The Design Process	D.7
Module DES103:	Design Techniques—Fundamentals	D.11
Module DES104:	Design Problems—Fundamentals	D.15
Module DES105:	CADD—Fundamentals	D.19
Module DES106:	Drafting for Design—Fundamentals	D.23

MODULE DES101: SKETCHING, DRAWING AND MODELLING—FUNDAMENTALS

Level: Introductory; recommended for all Design Studies students

Theme: Design Skills, Processes and Applications

Prerequisite: None

Module Parameters: No specialized equipment or facilities required

Students are introduced to observational sketching and drawing, and modelling, and develop skills that can be used and enhanced in further design activity. Students are also introduced to a selection of materials and tools and their uses.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">manually sketch, draw and model natural and manufactured three-dimensional forms	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">sketches, drawings and models of natural and manufactured three-dimensional forms produced in response to teacher-specified assignments. Images will be recognizable as the subject and demonstrate a sense of proportion and scale. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Introductory Level (to be developed)</i> <i>Reference Set for Introductory Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Design Studies Techniques, Tools, Materials and Applications Checklist (DESTMA)</i>	60
<ul style="list-style-type: none">use manual sketching/ drawing and modelling materials and tools effectively	<ul style="list-style-type: none">the use of three or more sketching, drawing and modelling materials and tools. <i>Assessment Tools</i> <i>Design Studies Techniques, Tools, Materials and Applications Checklist (DESTMA)</i>	30
<ul style="list-style-type: none">maintain and present a module portfolio	<ul style="list-style-type: none">maintenance and presentation of a module-based design portfolio emphasizing the development of sketching, drawing and modelling skills. <i>Assessment Tools</i> <i>Design Studies Assessment Video</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Design Studies Techniques, Tools, Materials and Application Checklist (DESTMA)</i>	10

MODULE DES101: SKETCHING, DRAWING AND MODELLING—FUNDAMENTALS
(continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> Basic Competencies Reference Guide and any assessment tools noted above</p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> observe and draw real objects; e.g., human forms, natural and manufactured objects, artifacts from different materials with differing textures and reflective properties experiment with various sketching and drawing styles used in different contexts; e.g., gesture, contour, tonal, isometric, perspective, croquis experiment with observational modelling to capture the essence of forms through easily manipulated materials; e.g., clay, paper, cardboard experiment with shape, and form; e.g., flat shapes on surfaces, 3-D forms joined together to make new forms, 3-D forms in proximity to each other be given the opportunity to use more than one medium (e.g., pencil, chalk, coloured marker, ink, paint, paper, plastic, wood, foam) to draw, sketch and model. 	<p>Sketching, drawing and modelling skills can only be developed through practice. Some students will exhibit natural ability in this area, while others will need a lot of specific instruction. Holding a pencil correctly may be new and different for some students. Using visual construction techniques such as drawing a cylindrical shape inside or three-dimensional box will help many students with proportion and visual/spatial relationships. An introduction to basic drawing tools; e.g., pencils, rulers, set squares, will also help students with limited background in this area.</p>

MODULE DES101: SKETCHING, DRAWING AND MODELLING—FUNDAMENTALS
(continued)

Concept	Specific Learner Expectations	Notes
Skills Development (cont'd)	<i>The student should:</i>	<p>Designers who work in three dimensions often visualize their ideas by manipulating various materials such as wooden or foam blocks of differing shapes. This manipulation provides a three-dimensional model of what the potential solution might look like with respect to size, shape, volume, etc.</p> <p>Different media provide different results and students need to be aware of this. Skills in the use of various media will develop as students engage in other design activities.</p>
Elements and Principles of Design	<ul style="list-style-type: none"> recognize and identify the design elements (line, shape, form, pattern, space, texture, colour) and principles (balance, emphasis, proportion, rhythm, unity and variety) as they apply to composition and form. 	<p>Awareness of the elements and principles of design will increase with each design challenge. Students need only recognize the existence of these elements and principles in this module and be able to identify some of them.</p>

MODULE DES101: SKETCHING, DRAWING AND MODELLING—FUNDAMENTALS
(continued)

Concept	Specific Learner Expectations	Notes
Presentation, Design Journal and Portfolio	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● discuss sketches, drawings and models with the teacher ● discuss his or her work with at least one other class member ● maintain a design journal/sketchbook. This would typically include notes, ideas and rough or thumbnail sketches ● maintain a portfolio of ongoing observational drawing and modelling activities, which in this module would include all sketches, drawings and models produced in the module, the design journal and any other supplementary material considered important. 	<p>Students at the introductory level may be reluctant to share and discuss their work with a group of their peers. Sharing can be done informally, one on one with the teacher, and as the opportunity presents itself, with one or more class members.</p> <p>The portfolio will provide a developmental record of the student's breadth and depth of observational drawing and modelling capability. It should be updated upon completion of each design task. Over time, less important examples of work should be replaced with more significant pieces.</p>

MODULE DES102: THE DESIGN PROCESS**Level:** Introductory**Theme:** Design Skills, Processes and Applications**Prerequisite:** Sketching, Drawing and Modelling—Fundamentals (DES101; Recommended corequisite)**Module Parameters:** No specialized equipment or facilities required

Design is a process-based activity. The student begins the process by developing an understanding of the problem through research. The student then develops possible solutions, working through them to arrive at a final appropriate solution.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● apply a design process throughout the instructional period	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● observation of the work processes throughout the instructional period and review of the design journal. <i>Assessment Tools</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	60
<ul style="list-style-type: none">● produce a designed solution	<ul style="list-style-type: none">● student's response to a teacher-specified, introductory level design brief in two-dimensional, three-dimensional, and/or combined two-dimensional and three-dimensional design. <i>Assessment Tools</i> <i>Sample Assignment/Project Briefs for Introductory Level (to be developed)</i> <i>Reference Set for Introductory Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	30
<ul style="list-style-type: none">● maintain and present a module portfolio	<ul style="list-style-type: none">● maintenance and presentation of a module-based design portfolio emphasizing the use of a process of design through module work. <i>Assessment Tools</i> <i>Reference Set for Introductory Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	10

MODULE DES102: THE DESIGN PROCESS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Being Innovative". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> recognize and be able to state the components of a design process (design loop); e.g., <ul style="list-style-type: none"> identify the need/problem research the problem generate ideas and visualize potential solutions; e.g., through drawing, computer modelling, three-dimensional modelling choose the most promising idea (the idea that seems to best meet the need identified in the design brief) make/model the idea into a solution present the solution evaluate the solution read a design brief and be able to identify the task, constraints and other pertinent information. 	<p>Design tends to be an iterative process; i.e., while the process of design may appear to be linear, students will typically revisit steps as the design activity progresses.</p> <p>Presentation of work at logical junctures within the planning and process stages provides an opportunity for students to share ideas, to gather ideas for their own projects, to develop their presentation skills and to build confidence in their abilities. This should be done in an informal manner. (See the notes on presentation from Sketching, Drawing and Modelling—Fundamentals.)</p> <p>Briefs are common in the design field. They provide the designer with basic information for the design task and are often based on something that exists.</p>

MODULE DES102: THE DESIGN PROCESS (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● follow a design process to create solutions for one or more projects taken from two-dimensional design (e.g., poster, brochure, repetitive pattern, personal monogram), and/or three-dimensional design (e.g., cardboard desk organizer, cloth locker organizer, a self-propelled elastic band-powered car) and/or a project combining two- and three-dimensional design (e.g., bicycle light with logo, package for a festive ornament, model of a museum display or store window display package for an abstract idea such as multiculturalism) based on design briefs provided ● select and use appropriate tools and materials as outlined in the design brief. 	<p>The product/solution to the problem will be determined by the need as stated in the design brief. Students will need help interpreting the first few briefs they receive.</p> <p>Successful designers tend to have a broad range of experience. Having students engage in a variety of design tasks will help to broaden their horizons and enhance their ability to design.</p> <p>Teachers may wish to limit tools and materials to provide specific constraints to the design projects assigned.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● discuss projects with the teacher ● discuss his or her projects with at least one other class member ● maintain a design journal and a portfolio, which in this module would include all design work such as drawings, research notes and designed solutions, and any other supplementary material considered important ● prepare for and actively participate in a final presentation and critique of design work. Effectively communicate intentions and decision making related to the design project. 	<p>Students need to be constructively critical of their own designs and the designs of others. It is not good enough to "like" or "dislike" without giving reasons for their preference. It is important that they recognize this both as designers and as consumers of design. At this level they should be able to critically discuss their work with their teacher.</p> <p>Students can track the steps they took and materials/ processes they used in solving their design brief. Their journal can become a future reference source. It is also a good mechanism for assessing process.</p>

MODULE DES103: DESIGN TECHNIQUES—FUNDAMENTALS**Level: Introductory****Theme: Design Skills, Processes and Applications****Prerequisite: Sketching, Drawing and Modelling—Fundamentals (DES101; recommended corequisite)****Module Parameters: No specialized equipment or facilities required**

This is a skill building module. Here the student develops skills and techniques appropriate to design through engaging in a variety of activities in various contexts. Techniques may include drawing, use of notation, use of tools and equipment, and layout, cutting, joining and measuring.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● sketch, draw and model to expand and/or solidify two- and three-dimensional design techniques ● identify, select and use elements and principles of design in project activities ● use two- and three-dimensional design techniques when solving simple design problems 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● safe and proficient use of four sketching and/or drawing techniques and three modelling techniques through practice exercises. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Introductory Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Design Studies Techniques, Tools, Materials and Application Checklist (DESTMA)</i> ● identification of elements and principles of design through teacher-specified examination or project work. <i>Assessment Tools</i> <i>Authorized resources for explanation and examples of elements and principles of design</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> ● safe and proficient use of at least two sketching, drawing and/or modelling techniques in the context of resolving a teacher-specified introductory level project brief. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Introductory Level (to be developed)</i> <i>Design Tools, Materials and Processes reference list</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Design Studies Techniques, Tools, Materials and Application Checklist (DESTMA)</i> 	<p>50</p> <p>10</p> <p>30</p>

MODULE DES103: DESIGN TECHNIQUES—FUNDAMENTALS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a module portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio emphasizing the techniques learned through module work. <p><i>Assessment Tools</i> <i>Reference Set for Introductory Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	10
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● learn techniques common to two- and three-dimensional design such as: <ul style="list-style-type: none"> - brainstorming ideas; e.g., thumbnail sketching, working with a partner to generate ideas - laying out; e.g., shapes and images within a defined space, aligning, measuring, drawing design components - using typography; e.g., generating and manipulating letters, numbers and symbols - modelling; e.g., measuring, cutting, joining, bending ● learn and be able to use terminology associated with the techniques learned; e.g., know what a thumbnail sketch is and how it is used, know the similarities and differences between a serif and san-serif type styles ● demonstrate basic skills associated with tasks engaged in; e.g., be able to organize several images within a defined two-dimensional space using the principles of design, be able to measure accurately and cut/join/bend materials safely. 	<p>The techniques and terminology learned in this module will form part of the foundation for continuing on in Design Studies. Additional techniques and terminology will be learned in other modules as the need arises. Teachers may wish to teach additional material in this module where appropriate to their program.</p>

MODULE DES103: DESIGN TECHNIQUES—FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
Elements and Principles of Design	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● identify the elements and principles of design and indicate how they have been used in the context of the techniques learned and problems addressed. 	<p>The elements and principles of design are listed in Sketching, Drawing and Modelling—Fundamentals.</p>
Applied Problem Solving	<ul style="list-style-type: none"> ● select two or more design problems in two and/or three dimensions and work them through, using a process of design ● use basic techniques common to two- and/or three-dimensional design in working through design problems ● select and use appropriate tools and materials as outlined in the design brief. 	<p>Teachers may wish to prescribe design briefs for their students in this module in order to ensure specific techniques are learned.</p> <p>Students are expected to work within the constraints identified in each design brief. Constraints related to materials, deadlines, function, aesthetics, ergonomics, etc., will require students to assign priority to optimize their result. Students will need guidance to learn the decision-making skills necessary to do this.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations in Sketching, Drawing and Modelling—Fundamentals and The Design Process. 	<p>For some students, this will be the third module taken in Design Studies. Students who are comfortable with presenting their work to others should be encouraged to do so. Through discussing their work with others, the basics of critiquing (making and receiving suggestions) can be established.</p> <p>To encourage students to present and discuss their work, teachers may have two or three students make a joint presentation thereby reducing the pressure on one individual.</p>

MODULE DES104: DESIGN PROBLEMS—FUNDAMENTALS**Level:** Introductory**Theme:** Design Skills, Processes and Applications**Prerequisite:** The Design Process (DES102) OR Design Techniques—Fundamentals (DES103; Recommended corequisite)**Module Parameters:** No specialized equipment or facilities required

Students apply the design process (see The Design Process module) to solve a variety of two- and/or three-dimensional design problems using techniques such as sketching, drawing and modelling, and other techniques learned in Design Techniques—Fundamentals.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● sketch, draw and model to expand and/or solidify two- and three-dimensional design techniques ● resolve simple project briefs working collaboratively ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● safe and proficient use of sketching, drawing and/or modelling techniques in the context of resolving an introductory level project brief. <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Introductory Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	20
	<ul style="list-style-type: none"> ● resolution of teacher-specified introductory level project brief. Observation of collaboration during the work processes throughout the instructional period. <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Introductory Level (to be developed)</i> <i>Reference Set for Introductory Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	60
	<ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio emphasizing the degree of resolution of the project brief and the student's discourse regarding the process(es), tools, materials and techniques used in resolving the project brief, why these were chosen and to what effect. <p><i>Assessment Tools</i> <i>Reference Set for Introductory Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	20

MODULE DES104: DESIGN PROBLEMS—FUNDAMENTALS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Being Innovative". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> select appropriate techniques and use them in the context of the projects assigned be introduced to basic skills necessary for working cooperatively (e.g., appropriate conduct, leadership, commitment, negotiation, sharing); this would mean working in a design team or consulting with relevant experts for at least one design activity. 	<p>Students who have successfully completed The Design Process and Design Techniques—Fundamentals should be able to select and apply techniques they have learned to assigned tasks. Some students will require assistance in making appropriate selections.</p> <p>Working with others is very important in design. Many major design innovations result from collaborative effort. Students who pursue a design career should become comfortable and productive in a team setting. While this is the first module that emphasizes collaborative work, it should be reinforced throughout Design Studies.</p>

MODULE DES104: DESIGN PROBLEMS—FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
Elements and Principles of Design	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● use the elements and principles of design in projects assigned ● be able to show which elements have been used and how the principles of design have been applied in each project assigned. 	Students should be able to use some of the elements and principles of design to show how they have been used. Teachers may wish to informally check this with their students.
Applied Problem Solving	<ul style="list-style-type: none"> ● work through a design process to solve two-dimensional, three-dimensional and/or combined two- and three-dimensional design problems ● select and use appropriate tools and materials as outlined in the design brief. 	<p>In this module, teachers should provide a selection of level-appropriate design briefs for students to choose from. Students should work through the briefs with less specific direction from the teacher. There is an opportunity for students to work in design teams rather than individually.</p> <p>Teachers may wish to provide a wider range of tools and materials than those provided in the Design Techniques—Fundamentals module, to provide students with a greater resource base to choose from. The choice of materials and tools made by the students can be one indicator of their level of capability in design.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see the Specific Learner Expectations for Sketching, Drawing and Modelling—Fundamentals, The Design Process and other introductory level modules. 	See notes from Design Techniques—Fundamentals and other introductory level modules.

MODULE DES105: CADD—FUNDAMENTALS**Level:** Introductory**Theme:** Drafting for Design and Technical Drawing Skills**Prerequisite:** Drafting for Design (DES106; Recommended corequisite)**Module Parameters:** CADD Software

The ability to use a personal computer effectively is becoming essential in design. In this module, the student develops basic skills and knowledge in Computer Aided Design and Drafting (CADD).

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic knowledge and skills required to operate Computer Aided Design and Drafting (CADD) software use CADD to produce a multiview drawing and/or pictorial drawing maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> skills examination on CADD software. <i>Assessment Tools</i> <i>CADD Assessment Rubric (to be developed)</i> production of a multiview and/or pictorial drawing. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Introductory Level (to be developed)</i> <i>Reference Set for Introductory Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric-Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric-Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> maintenance and presentation of a module-based design portfolio emphasizing his or her understanding of CADD software operation skills through the student's discourse regarding the process(es), tools, and functions used in producing his or her multiview drawing. Note: The portfolio in this module may consist of a computer disk that is presented on-screen then submitted for assessment. <i>Assessment Tools</i> <i>Reference Set for Introductory Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> 	<p>30</p> <p>60</p> <p>10</p>

MODULE DES105: CADD—FUNDAMENTALS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify and access commonly used tools (e.g., pens, lines, fillets, chamfers, shapes, rulers, scales), methods (e.g., snapping to grid, measuring, scaling) and functions (e.g., snapping to the end of a line, centering, cleaning up, breaking lines) with teacher direction and assistance read and interpret pictorial drawings and multiview sketches for pertinent information use CADD skills to produce two-dimensional multiview drawings complete with dimensions print or plot drawings. 	<p>Some students may have the background to perform these operations upon entering the module. Students should be encouraged to share their knowledge with each other. Where appropriate, students could work as partners during this module.</p> <p>Complementary modules to this one are available in the Information Processing strand and may be drawn from there if additional emphasis is required.</p> <p>Teachers will determine the computer and software students will use.</p> <p>An important indication of a student's skill development in this module will be how quickly they can access and use the CADD software to produce assigned drawings. This element of "speed" can be one indicator of capability when the student is assessed.</p>

MODULE DES105: CADD—FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● select and use CADD tools, methods and functions to produce multiview drawings (minimum three views) from simple three-dimensional objects (e.g., angled wooden blocks, foot stool, chair) or from pictorial drawings (e.g., isometric, oblique, perspective) of these objects ● demonstrate the use of layers on at least one drawing. 	Applied problem solving in this module centres on the student's ability to select appropriate tools, methods and functions for achieving specific tasks.
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations from Design Techniques—Fundamentals and other introductory level modules. In this module, the portfolio may take the form of a computer disk containing completed and partially completed work. 	As this is a skill development module, students may not formally present their work as they would in other modules (e.g., Design Problems—Fundamentals). Students should still be able to describe what they are doing if asked.

MODULE DES106: DRAFTING FOR DESIGN—FUNDAMENTALS**Level:** Introductory**Theme:** Drafting for Design and Technical Drawing Skills**Prerequisite:** Sketching, Drawing and Modelling—Fundamentals (DES101; Recommended corequisite)**Module Parameters:** CADD software optional

This module concentrates on basic skill development. The student develops basic knowledge, skills and techniques of drafting appropriate for visualizing and illustrating simple design problems.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> produce pictorial representations and multiview drawings from sketches and/or three-dimensional objects 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> production of one of each of the following based on teacher-specified three-dimensional references and/or sketches: <ul style="list-style-type: none"> freehand pictorial drawing aided by a pictorial drawing grid, pictorial drawing aided by mechanical drafting equipment or CADD, and dimensioned multiview drawing aided by mechanical drafting equipment or CADD <p><i>Assessment Tools</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric-Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric-Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	90
<p>OR</p> <ul style="list-style-type: none"> produce pictorial representations and surface developments (flat patterns) for items in context (e.g., garments, sheet metal fabrication) 	<p>OR</p> <ul style="list-style-type: none"> production of the following based on teacher-specified three-dimensional references and/or sketches: <ul style="list-style-type: none"> two freehand pictorial drawings of items (e.g., garments, sheet metal, packaging) in context, and one surface development (flat pattern) for construction aided by mechanical drafting equipment or CADD. 	90

MODULE DES106: DRAFTING FOR DESIGN—FUNDAMENTALS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● produce pictorial representations and surface developments (flat patterns) for items in context (e.g., garments, sheet metal fabrication) (cont'd) ● maintain and present a design portfolio ● demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Introductory Level (to be developed)</i> <i>Reference Set for Introductory Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric-Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric-Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and the student's discourse, emphasizing his or her understanding of basic drafting techniques and their application to drawings produced. <p><i>Assessment Tools</i> <i>Design Studies Assessment Video</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric-Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric-Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p> <ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p></p> <p>10</p> <p>Integrated throughout</p>

MODULE DES106: DRAFTING FOR DESIGN—FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● recognize and identify common pictorial drawing types; e.g., isometric, oblique, one- and two-point perspective ● recognize and identify multiview drawings, their common views (e.g., front, top, side) and discriminate between first angle projections and third angle projections ● produce at least one of the following within the context of assigned projects: <ul style="list-style-type: none"> – isometric drawing – oblique drawing (either Cavalier or Cabinet) – perspective drawing (either one-point or two-point) or <ul style="list-style-type: none"> – drawings appropriate for illustrating clothing and accessories ● produce at least one multiview drawing (e.g., front view, side view, top view) or produce at least one surface development (flat pattern) for a garment. 	<p>In this module, students should engage in a variety of activities that will teach basic drafting skills and techniques. These could be extensions of designs developed in previously completed modules such as Design Techniques—Fundamentals or Design Problems—Fundamentals. Teachers will need to determine the number of drawings of each type necessary for students to develop skills and understanding in this area.</p> <p>Students may demonstrate more than one drawing style within the same assignment. For example, a student may produce a multiview drawing (e.g., front, top, side views) of a toy they designed and pictorial drawing (e.g., isometric) of the toy on the same drawing sheet.</p>

MODULE DES106: DRAFTING FOR DESIGN—FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (cont'd)	<i>The student should:</i>	<p>"Drafting" may be applied in a number of contexts beyond the drafting table or terminal. One of these is flat pattern design within the fashion industry. This module exemplifies the linkage and transferability between traditional disciplines.</p> <p>Students may use traditional drafting technology, CADD or other technology specified by the teacher during this module.</p>
Applied Problem Solving	<ul style="list-style-type: none"> ● use drafting techniques learned in this module to illustrate particular aspects of designed solutions to simple design problems; e.g., a hinge system on a box lid, a seam where two surfaces are joined, a pin to hold a wheel on an axle ● where appropriate, use drafting techniques to illustrate how parts of a design go together. 	<p>Students should recognize drafting skills and techniques as tools they can use in many areas of design. Teachers may wish to brainstorm possible uses of these techniques with their students.</p> <p>Applied problem solving here relates to the student's ability to select appropriate techniques from those learned in this module to produce required illustrations.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see the Specific Learner Expectations for Sketches, Drawing and Modelling—Fundamentals and CADD—Fundamentals. 	See notes for Design Techniques—Fundamentals.

MODULE CURRICULUM AND ASSESSMENT STANDARDS

INTERMEDIATE LEVEL

The following pages define the curriculum and assessment standards for the intermediate level of Design Studies.

Intermediate level modules help students build on the competencies developed at the introductory level and focus on developing more complex competencies. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

Module DES201:	2-D Design—Applications	E.3
Module DES202:	3-D Design—Applications	E.7
Module DES203:	CADD—Applications	E.11
Module DES204:	Drafting for Design—Applications	E.13
Module DES205:	Technical Drawing—Applications	E.17
Module DES206:	The Evolution of Design	E.21

MODULE DES201: 2-D DESIGN—APPLICATIONS**Level:** Intermediate**Theme:** Design Skills, Processes and Applications**Prerequisite:** The Design Process (DES102) AND one other introductory level module (Recommended)**Module Parameters:** No specialized equipment or facilities required

Students apply the design process and other knowledge, skills and processes learned at the introductory level to projects in two-dimensional design. Projects in this module typically deal with communication problems and issues. Students take greater responsibility for managing their learning and work cooperatively with others.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● resolve intermediate level two-dimensional design briefs	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● resolution of a teacher- and/or student-specified intermediate level two-dimensional project brief. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Intermediate Level (to be developed)</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	60
<ul style="list-style-type: none">● use the elements and principles of design effectively	<ul style="list-style-type: none">● selection and effective use of elements and principles of design in project work. <i>Assessment Tools</i> <i>Authorized resources for explanation and examples of elements and principles of design</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20

MODULE DES201: 2-D DESIGN—APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> – the aesthetic quality of the product, – the process(es), tools, materials and techniques used in resolving the design brief, – why these were chosen, and – to what effect they were used. <p><i>Assessment Tools</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● increase their proficiency with skills and techniques learned at the introductory level; e.g., practising sketching and drawing ● identify additional techniques, tools, materials and other resources (e.g., tones, texture and colour; markers and paints; photographs and illustrations; computer generated or captured images; type faces) and use them in design projects ● write a design brief and structure a plan for resolving a two-dimensional design project ● organize and manage personal learning with limited external direction. 	<p>Students can expand their knowledge of two-dimensional design in part through exposure to a wider selection of materials, tools and techniques. They must, however, solidify and increase their abilities with previously learned/used materials, tools and techniques. It may be best to reinforce existing practices and add new learning where appropriate.</p>

MODULE DES201: 2-D DESIGN—APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (cont'd)	<i>The student should:</i>	<p>Students should learn to write design briefs and structure plans for resolving the brief. Briefs and plans may be based on teacher- or student-identified needs. Students will learn to prepare briefs and plans, and manage their own learning at this level, and to do so independently at the advanced level.</p> <p>Many design solutions will not be completed full size but will be "scale" models. For example, a student might prepare a scale module of a mural that could be painted on a building. Students can learn the concept of scale in this context then apply it repeatedly in other design tasks.</p>
Elements and Principles of Design	<ul style="list-style-type: none"> ● use elements and principles of design in design projects ● experiment with one or more elements (e.g., colour, line, shape) and/or principles (e.g., rhythm, balance) to achieve desired affects. 	
Applied Problem Solving	<ul style="list-style-type: none"> ● follow through a design process to solve two-dimensional design problems; e.g., CD covers, sports graphics, newspaper or magazine advertisements, billboards or wall murals, corporate logos or neon graphics ● select and use appropriate tools and materials as outlined in the design brief. 	<p>Intermediate level Design Studies students must take a problem as given, generate ideas for a solution and work them through. Teachers will need to teach more advanced techniques, or direct their students to appropriate resources, but the responsibility for problem solving should rest with the student.</p>

MODULE DES201: 2-D DESIGN—APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Presentation, Design Journal and Portfolio	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● participate in interim critiques that include peer review and input ● prepare for and actively participate in a final presentation and critique of design work. . . . Effectively communicate intentions and decision making related to the design project ● maintain a design journal/sketchbook of the project, which would include research notes, ideas, writings, sketches, photographs, cuttings, etc., related to the project ● maintain a portfolio of ongoing design activity, which might include sketches, freehand drawings, rendered drawings, technical drawings, photographs of models (physical and/or CADD), reports, etc., plus work from previously completed modules. 	<p>Students working at this level should be able to present their work to their classmates in informal critique sessions.</p> <p>Critiques of completed projects provide a venue for students to present their work and to celebrate their success with their peers.</p> <p>Participation guidelines should be established and clearly understood by students before a critique occurs.</p> <p>Students who have taken several modules and have maintained a portfolio will have a sizable collection of design projects. They may begin culling some less successful projects in favour of newer projects showing more advanced learning. An alternative would be to start a second portfolio of presentation quality pieces while maintaining a working portfolio. See Portfolio Presentation for additional ideas.</p>

MODULE DES202: 3-D DESIGN—APPLICATIONS**Level:** Intermediate**Theme:** Design Skills, Processes and Applications**Prerequisite:** The Design Process (DES103) AND one other introductory level module (Recommended)**Module Parameters:** No specialized equipment or facilities required

Students apply the design process and other knowledge, skills and processes learned at the introductory level to projects in three-dimensional design. Projects in this module typically deal with problems and issues related to product design. Students take greater responsibility for managing their learning and work cooperatively with others.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● resolve intermediate level three-dimensional design briefs	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● resolution of a teacher- and/or student-specified intermediate level three-dimensional project brief. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Intermediate Level (to be developed)</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	60
<ul style="list-style-type: none">● use the elements and principles of design effectively	<ul style="list-style-type: none">● selection and effective use of elements and principles of design in project work. <i>Assessment Tools</i> <i>Authorized resources for explanation and examples of elements and principles of design</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20

MODULE DES202: 3-D DESIGN—APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> – the aesthetic quality of the product, – the process(es), tools, materials and techniques used in resolving the design brief, – why these were chosen, and – to what effect they were used. <p><i>Assessment Tools</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● increase their proficiency with skills and techniques learned at the introductory level; e.g., cutting, joining, bending, measuring ● identify additional techniques, tools, materials and other resources (e.g., materials such as woods, metals, plastics, fibres, techniques specific to cutting, joining or bending materials not used before, tools specific to these activities) and use them in design projects ● write a design brief and structure a plan for resolving a three-dimensional design project ● organize and manage personal learning with limited external direction 	<p>See the notes from 2-D Design—Applications as they apply equally to this module.</p> <p>Scientific principles are applied continually in three-dimensional design. Recognizing these principles and how they may be applied will advance students' knowledge and ability in design and provide practical uses for theoretical constructs learned in other programs.</p>

MODULE DES202: 3-D DESIGN—APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (cont'd)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> recognize and be able to identify mathematical and scientific principles as they apply to design projects assigned; e.g, structural principles applied to strength and stability, principles of mass and buoyancy applied to flotation; principles of energy and control as applied to movement and power. 	
Elements and Principles of Design	<ul style="list-style-type: none"> use elements and principles of design in design projects. 	It is important for students to experiment with form; the form of objects and the space they occupy.
Applied Problem Solving	<ul style="list-style-type: none"> follow through a design process to solve three-dimensional design problems; e.g., a toy made of wood or fabric for a pre-school aged child, a sustained motion machine, a "boat" made of wood, paper, glue and shellac or a seat for a patio or garden select and use appropriate tools and materials as outlined in the design brief. 	<p>Students should examine various types of structures and the principles they are based on. They will learn why some structures are successful while others fail. This knowledge can then be applied to their design tasks.</p> <p>Scale models may be produced in this module. For example, a student may produce a scale model of a chair, a catapult or a bridge. The model could be tested for strength and durability, then if appropriate, a final prototype could be produced.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> see Specific Learner Expectations from 2-D Design—Applications. 	See notes from 2-D Design—Applications.

MODULE DES203: CADD—APPLICATIONS**Level:** Intermediate**Theme:** Drafting for Design and Technical Drawing Skills**Prerequisite:** CADD—Fundamentals (DES105) AND at least one other module where CADD was used (Recommended)**Module Parameters:** CADD software

Students apply their learning from CADD—Fundamentals, and add knowledge, skills and techniques associated with Computer Aided Design and Drafting (CADD) in the context of new design-related tasks.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
The student will: <ul style="list-style-type: none">● use Computer Aided Design and Drafting (CADD) software to produce intermediate level multiview and/or pictorial drawings	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● production of a multiview and/or pictorial drawing using teacher-specified CADD software. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Intermediate Level (to be developed)</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>CADD Assessment Rubric (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	80
<ul style="list-style-type: none">● maintain and present a design portfolio	<ul style="list-style-type: none">● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the accuracy of application of the CADD software to the drawing assignment, and the student's discourse regarding the process(es), tools and functions used in producing his or her drawing. <i>Assessment Tools</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20

MODULE DES203: CADD—APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify and access commonly used tools, methods and functions (see CADD—Fundamentals) without teacher direction and assistance read and interpret pictorial and other types of sketches for pertinent information use CADD skills to produce layered fully dimensioned multiview drawings and pictorial drawings print or plot drawings. 	<p>Students completing this module should be fully versed in basic CADD use.</p> <p>Teachers may provide students with experience on other computer software that links to and/or supports CADD.</p>
Applied Problem Solving	<ul style="list-style-type: none"> select and use CADD tools, methods and functions to produce layered multiview drawings and pictorial drawings based on pictorial sketches or real three-dimensional objects demonstrate the use of layers on at least one drawing. 	<p>As with CADD—Fundamentals, applied problem solving in this module centres on the student's ability to select appropriate tools, methods and functions for achieving specific tasks.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> see Specific Learner Expectations from CADD—Fundamentals and other introductory and intermediate level modules. In this module, the portfolio may take the form of a computer disk containing completed and partially completed work. 	<p>A critique in this module may emphasize sharing information about CADD rather than solutions to design problems. Specific project activities should concentrate on skill development with a specific CADD package.</p>

MODULE DES204: DRAFTING FOR DESIGN—APPLICATIONS

Level: Intermediate

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: **Drafting for Design—Fundamentals (DES106) AND one other introductory level Design Studies module (Recommended)**

Module Parameters: CADD software optional

Skills in assembly, section and/or auxiliary drawing are learned in this module. Students further develop the knowledge, skills and techniques learned at the introductory level in Drafting for Design—Fundamentals (e.g., pictorial drawing, multiview drawing, surface developments [flat pattern for garments]) by applying them in the context of more complex design projects.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● produce pictorial drawings (e.g., isometric, oblique, one- and two-point perspective) using rendering styles and techniques (e.g., pencil, ink, colour, computer generated) within the context of design projects 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● production of pictorial drawings and renderings within the context of a teacher- and/or student-specified design assignments. <p><i>Assessment Tools</i></p> <p><i>Sample Assignments/Project Briefs for Intermediate Level (to be developed)</i></p> <p><i>Reference Set for Intermediate Level (to be developed)</i></p> <p><i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i></p> <p><i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i></p> <p><i>Design Studies Project Assessment Guide (DESAGD)</i></p>	40
<ul style="list-style-type: none"> ● produce assembly, section, auxiliary, and/or multiview drawings either manually or with the aid of a computer 	<ul style="list-style-type: none"> ● production of one of each of the following based on teacher- and/or student-specified three-dimensional references and/or sketches and aided by mechanical drafting equipment or CADD software: <ul style="list-style-type: none"> – assembly drawing, – section drawing, – auxiliary drawing, and – dimensioned multiview drawing 	40

OR
OR

MODULE DES204: DRAFTING FOR DESIGN—APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● produce surface developments (flat patterns) for items (e.g., garments, sheet metal, packaging) either manually or with the aid of a computer ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● production of the following based on teacher- and/or student-specified three-dimensional references and/or sketches and aided by mechanical drafting equipment or CADD software: <ul style="list-style-type: none"> – surface development (flat pattern) for construction. <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Intermediate Level (to be developed)</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the student's discourse, emphasizing: <ul style="list-style-type: none"> – his or her understanding of pictorial drawing and rendering styles and techniques, – how these can be used, and – how these were applied in the drawings produced. <p><i>Assessment Tools</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	<p>40</p> <p>20</p>
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

MODULE DES204: DRAFTING FOR DESIGN—APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● enhance skills in pictorial drawing and/or in producing surface development drawings (flat patterns) ● produce at least two examples chosen from the following drawings types: assembly, sectional, or auxiliary and be able to describe their purpose and application within a design project ● use appropriate terminology within the context of each design project. 	<p>In this module, students should engage in a variety of activities that involve generating drawings based in a design problem. The specific skills should be taught within this context. Some teachers may take a single theme (e.g., lake cottage, all-terrain vehicle or garment) as the context for learning. Other teachers will want their students to engage in two or more smaller projects.</p> <p>Students need to be able to communicate in a common language. Learning specific terminology associated with this area will help the students communicate effectively to each other and to outside parties.</p>
Applied Problem Solving	<ul style="list-style-type: none"> ● select appropriate drawing types and styles and use them to accurately illustrate potential design solutions as part of the resolution of a design brief ● select and use appropriate tools and materials as outlined in each design brief. 	<p>Students may use this module in several contexts including architecture, landscape design, product design, and flat pattern design for fashion. Students may use traditional drafting equipment, CADD or other technology specified by the teacher to complete the module.</p> <p>Students may need guidance in choosing appropriate drawing types and approaches for the design project(s) they engage in.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Applications and CADD—Applications. 	<p>See notes for 2-D Design—Applications and CADD—Applications.</p>

MODULE DES205: TECHNICAL DRAWING—APPLICATIONS**Level:** Intermediate**Theme:** Drafting for Design and Technical Drawing Skills

Prerequisite: Drafting for Design Fundamentals (DES106) AND one other introductory level Design Studies module recommended (Note: teachers may wish to make Drafting for Design Applications a corequisite for this module).

Module Parameters: CADD software optional

Students develop accurate multiview drawings from previously produced sketches, and learn the common understandings, conventions and language associated with technical drawing.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
The student will: <ul style="list-style-type: none">● produce technical drawings for simple structures, products and/or components	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none">● set of technical drawings for a simple structure and/or a product and/or a manufactured component. <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Intermediate Level (to be developed)</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	60
<ul style="list-style-type: none">● accurately dimension and notate drawings	<ul style="list-style-type: none">● accurate dimensioning and notation of all drawings in accordance with standards and conventions. <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Intermediate Level (to be developed)</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	20

MODULE DES205: TECHNICAL DRAWING—APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● attend to all pertinent codes and specifications as they apply to drawings produced 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● identification and application of codes and specifications as they pertain to the project and as determined by the teacher and/or other qualified individual. <p><i>Assessment Tools</i> <i>Local, regional, provincial, national and international reference manuals for codes and standards</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	20
<ul style="list-style-type: none"> ● maintain and present a design portfolio 	<ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on: <ul style="list-style-type: none"> - the quality and accuracy of the drawings produced, and the student's discourse, emphasizing: <ul style="list-style-type: none"> ● his or her understanding of technical drawing techniques, ● how these were applied in the drawings produced, and ● the codes and specifications addressed in the drawings. <p><i>Assessment Tools</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	20

MODULE DES205: TECHNICAL DRAWING—APPLICATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> recognize the need for specific types of drawings (e.g., detail, assembly, sectional, auxiliary, exploded view) and where and when they are used produce at least one example of each of the following drawings based on sketches provided and accurately dimension and notate each drawing: <ul style="list-style-type: none"> multiview drawing (showing a minimum of three views) a detail or assembly drawing a sectional or auxiliary drawing produce a pictorial drawing (isometric or oblique or perspective) of the object represented in the multiview drawing observe standard conventions of technical drawing (e.g., title blocks, labelling/lettering, dimensioning, scale and measuring, line types such as solid, hidden, projection, break, fold, phantom) as appropriate in drawings being completed interpret standards and codes as they apply to the drawings being done use appropriate terminology. 	<p>The focus of this module is to teach students basic technical drawing skills so they may prepare working drawings for the purpose of manufacturing construction and fabrication structures, products and systems. Students may use traditional drafting equipment, CADD or other technologies specified by the teacher to complete this module.</p> <p>This is a skill development module that supports the Drafting for Design, 3-D Design and Living Environments foci in Design Studies. The Drafting for Design and Technical Drawing modules also support CADD skills modules and modules from strands involved in manufacturing, construction and fabrication (e.g., Construction Technologies, Fabrication Studies, Fashion Studies, Communication Technology).</p>

MODULE DES205: TECHNICAL DRAWING—APPLICATIONS (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (cont'd)	<i>The student should:</i>	Teachers may wish to contextualize the work done in this module in one of these areas.
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none">• see Specific Learning Expectations for 2-D Design—Applications and CADD—Applications.	See notes for 2-D Design—Applications and CADD—Applications.

MODULE DES206: THE EVOLUTION OF DESIGN**Level:** Intermediate**Theme:** Business/Issues/History**Prerequisite:** None**Module Parameters:** No specialized equipment or facilities required

Student develop a historical framework for the importance and relevance of design within a cultural context by examining past and contemporary examples of designed artifacts.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none"> ● research historical and contemporary design ● make a formal presentation of research findings ● maintain and present a design portfolio 	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none"> ● demonstration of a general knowledge of the evolution of design through project work. <i>Assessment Tools</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Research Rubric (RESRBC)</i>	40
	<ul style="list-style-type: none"> ● formal presentation to teachers and peer(s) of research findings in one area of historical or contemporary design. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Intermediate Level (to be developed)</i> <i>Reference Set for Intermediate Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i>	40
	<ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis will be placed on the quality and accuracy of the research. <i>Assessment Tools</i> <i>Reference Set for Intermediate Level</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20

MODULE DES206: THE EVOLUTION OF DESIGN (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Communication". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> conduct research in design identify and explain the relationship between a design solution in the past and a current design solution (e.g., buildings, graphics, fashion and transportation) including the influence of cultural, global, ethical and environmental conditions on the solution. 	<p>This module helps students explore different avenues of design by examining the work of designers through history. Several different approaches may be taken. For example, students might study the work of a designer working today and compare it with the work of a designer from the 1930s; they might take an old artifact and try to reproduce it; they might follow the development of a particular product, process or system (e.g., brewing coffee or the development of plastic) through history to the present day. Students need to consider the influences of cultural, ethical, social and/or environmental conditions on design. The point of the module is to give students a larger sense of design.</p>

MODULE DES206: THE EVOLUTION OF DESIGN (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● prepare a presentation of research findings; e.g., a research paper, a media presentation ● use tools, materials and other resources appropriate for the presentation; e.g., video equipment, computers, still cameras, projectors, display materials. 	Students might design their presentation in several different ways including reproducing a scale model of an artifact designed and used in the past or sequential drawings, or photographs of an object that has evolved over time, presentation panels depicting "designed" artifacts from a particular culture, sets for a "period" drama or a term paper on a selected topic.
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● present in interim findings for teacher/peer review and input ● prepare for and actively participate in a final presentation and critique describing the area of study and findings ● maintain a design journal/sketchbook of the project including research notes, ideas, writings, sketches, photographs, cuttings, etc., related to the project ● add notes, research documentation and presentation material to his or her portfolio of work from previously completed modules. 	See notes from 2-D Design—Applications.

MODULE CURRICULUM AND ASSESSMENT STANDARDS

ADVANCED LEVEL

The following pages define the curriculum and assessment standards for the advanced level of Design Studies.

Advanced level modules demand a higher level of expertise and help prepare students for entry into the workplace or a related post-secondary program.

Module DES301:	2-D Design—Studio (Form, Composition and Aesthetics)	E.3
Module DES302:	2-D Design—Studio (Communication and Human Factors)	E.7
Module DES303:	2-D Design—Studio (Materials and Production Processes)	E.11
Module DES304:	3-D Design—Studio (Form, Composition and Aesthetics)	E.15
Module DES305:	3-D Design—Studio (Communication and Human Factors)	E.19
Module DES306:	3-D Design—Studio (Materials and Production Processes)	E.23
Module DES307:	Living Environments—Studio (Human and Environmental Needs)	E.27
Module DES308:	Living Environments—Studio (Form and Space) ...	E.31
Module DES309:	Living Environments—Studio (Materials and Production Processes)	E.35
Module DES310:	Computer Aided Design and Modelling—Studio	E.39
Module DES311:	Drafting for Design—Studio (Base Drawings)	E.41
Module DES312:	Drafting for Design—Studio (Explanatory Drawings)	E.45
Module DES313:	Drafting for Design—Studio (Rendering and Presentation Techniques)	E.49
Module DES314:	Technical Drawing—Studio (Sections, Elevations and Auxiliary Views)	E.53
Module DES315:	Technical Drawing—Studio (Developments and Intersections)	E.57
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MODULE DES301: 2-D DESIGN—STUDIO (FORM, COMPOSITION AND AESTHETICS)**Level:** Advanced**Theme:** Design Skills, Processes and Applications**Prerequisite:** 2-D Design—Applications (DES201; Recommended)**Module Parameters:** No specialized equipment or facilities required

The student applies the theories, skills and techniques of organization of the visual image onto the two-dimensional format, to resolve complex design problems. Emphasis is placed on exploring form, composition and aesthetics within appropriate communication design solutions.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● address advanced problems in two-dimensional design	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● resolution of a teacher- and/or student-specified advanced level two-dimensional project brief. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	50
<ul style="list-style-type: none">● use elements and principles of design as they apply to composition in two-dimensional design	<ul style="list-style-type: none">● selection and effective use of elements and principles of design in project work. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for explanation and examples of elements and principles of design</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20
<ul style="list-style-type: none">● make rational judgments with respect to aesthetic quality in two-dimensional design solutions	<ul style="list-style-type: none">● justification and judgments made during designing with respect to aesthetics, brought forth within the presentation/critique. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	10

MODULE DES301: 2-D DESIGN—STUDIO (FORM, COMPOSITION AND AESTHETICS)
(continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> - the form, composition and aesthetic quality of the product, - the judgments made during the designing process, - why these were made, and - the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Innovation", "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● increase proficiency with skills and techniques learned at the introductory and intermediate levels ● identify and use additional techniques, tools, materials and other resources as required in projects undertaken ● organize and manage personal learning without external direction, in both individual and cooperative learning situations ● increase group work skills. 	

MODULE DES301: 2-D DESIGN—STUDIO (FORM, COMPOSITION AND AESTHETICS)
(continued)

Concept	Specific Learner Expectations	Notes
Elements and Principles of Design	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● identify the elements and principles of design used in the solution of each design problem and explain how their use has contributed to the aesthetics and function of the solution ● rationalize decisions made during designing and indicate how these decisions affected the aesthetic quality of the solution. 	<p>Students should be able to identify the elements and principles of design and use them effectively in resolving design tasks. It is important that they recognize how they can use the elements and principles to their best advantage.</p> <p>Decision making is central to successful design. Students at this level must make decisions and learn from the results.</p>
Applied Problem Solving	<ul style="list-style-type: none"> ● address one or more two-dimensional design problems; e.g., displays/exhibits, packaging graphics, textiles, advertising, murals, signage, posters, calendars, billboards, maps and charts ● identify each problem, write a project brief and structure a plan for resolution ● select and use appropriate tools and materials as outlined in the project brief. 	<p>Some students may take on a project of greater magnitude and therefore would not be required to complete more than one project in this module. Some students may also engage in large scale projects that require more than one module to complete.</p> <p>Advanced level students must be able to write out project briefs for themselves and others. They must be able to organize their work, select appropriate tools, equipment, materials, etc., to make the project successful. It is important that they be given responsibility for their learning and that the teacher is there to support them and provide guidance where necessary.</p>

MODULE DES301: 2-D DESIGN—STUDIO (FORM, COMPOSITION AND AESTHETICS)
(continued)

Concept	Specific Learner Expectations	Notes
Presentation, Design Journal and Portfolio	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● participate in interim and final critiques meeting or exceeding the expectations of intermediate level modules ● lead at least one interim or final critique at the advanced level ● maintain journal/sketchbook as described in The Design Process ● maintain a portfolio of ongoing design activity including all projected related material in two-dimensional design (see 2-D Design—Applications), the design journal, and appropriate supplementary material ● independently update portfolio, assessing portfolio for extraneous material (see 2-D Design—Applications). 	Advanced students should be able to lead a critique session. They should be given opportunity to do so at some point in their advanced level program.

MODULE DES302: 2-D DESIGN—STUDIO (COMMUNICATION AND HUMAN FACTORS)

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: 2-D Design—Studio (Form, Composition and Aesthetics) (DES301; Recommended)

Module Parameters: No specialized equipment or facilities required

The student investigates the impact, importance and influence of two-dimensional design within a cultural context and the social responsibility of the designer, and applies this information when resolving complex communication design problems.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● address complex problems in two-dimensional design involving communication	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● resolution of a teacher- and/or student-specified advanced level two-dimensional design. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	50
<ul style="list-style-type: none">● identify examples of effective and ineffective two-dimensional design	<ul style="list-style-type: none">● constructive analysis and criticism of two-dimensional design work of varying quality gathered from real world context. <i>Assessment Tools</i> <i>Authorized resources for examples</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	10
<ul style="list-style-type: none">● identify human factors commonly affected by two-dimensional design solutions and accommodate these within designed solutions	<ul style="list-style-type: none">● written or verbal identification of human factors commonly addressed in two-dimensional design, and the degree to which these are accommodated in the resolved project brief. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20

MODULE DES302: 2-D DESIGN—STUDIO (COMMUNICATION AND HUMAN FACTORS)
(continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> - the effectiveness of the designed solution in communicating its message, and - the degree to which the designed solution addresses identified human factors. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE DES302: 2-D DESIGN—STUDIO (COMMUNICATION AND HUMAN FACTORS)
(continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● identify and collect examples of “designed” communication and make judgments as to their effectiveness ● select at least three examples of commercially generated two-dimensional design and describe the impact of the examples on himself or herself; e.g., social/psychological impact, impact on himself or herself as a human being, how he or she feels about the design ● describe at least three ways human factors (e.g., physical, mental, ethical, cultural) can affect two-dimensional design; e.g., use of colour, cultural symbolism, response to size, shape, prominence. 	<p>Advanced level students must be able to determine levels of quality. They must apply this knowledge in their own design work.</p> <p>Design is done for a purpose—to meet a client’s need. It is important that students realize that not all designed ideas work. It is also crucial that students recognize the relationship of design to the human condition and the impact design can have on them and others, socially, psychologically and emotionally as well as physically.</p> <p>Designed items (e.g., communication systems, products) have a great impact on people. Students must recognize this, both as designers and as consumers of design. This study relates very closely to notions of consumerism and the place of design in a “consumer” society.</p>
Applied Problem Solving	<ul style="list-style-type: none"> ● address at least two different two-dimensional design problems involving communication; e.g., signs, advertising layouts, maps, packaging graphics, fabric motifs, flow diagrams, assembly drawings, cutting layouts, organizational charts ● identify each problem, write a project brief and structure a plan for resolution ● select and use appropriate tools and materials as outlined in each project brief. 	<p>Students may engage in new projects or continue projects begun in 2-D Design—Studio (Form, Composition and Aesthetics). See this module for additional notes.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics). 	<p>See notes from 2-D Design—Studio (Form, Composition and Aesthetics).</p>

MODULE DES303: 2-D DESIGN—STUDIO (MATERIALS AND PRODUCTION PROCESSES)

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: 2-D Design—Studio (Form, Composition and Aesthetics) (DES301; Recommended)

Module Parameters: No specialized equipment or facilities required

The student explores the production processes of two-dimensional design and the role of the designer as an organizer of appropriate materials, processes and systems. This understanding is applied by the student in the resolution of complex two-dimensional design problems.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● address advanced level problems in two-dimensional design involving materials and production processes 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● resolution of a teacher- and/or student-specified advanced level two-dimensional project brief. <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	40
<ul style="list-style-type: none"> ● select materials based on their properties and justify the use in the context of two-dimensional design; e.g., what works in a given situation to achieve a desired affect 	<ul style="list-style-type: none"> ● justification of selection of materials used in resolving design brief, brought forth within the presentation/critique. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	10
<ul style="list-style-type: none"> ● design and/or select and use a process to reproduce a two-dimensional product in quantity 	<ul style="list-style-type: none"> ● reproduction of a two-dimensional product in quantity (i.e., at least five copies) using a production process. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	30

MODULE DES303: 2-D DESIGN—STUDIO (MATERIALS AND PRODUCTION PROCESSES) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the quality of the reproduced product, and the student's discourse regarding: <ul style="list-style-type: none"> - the justification for the selection and use of materials for the designed solution, and - the strengths and weaknesses of the design and/or selected process used to reproduce the product. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Managing Resources", "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE DES303: 2-D DESIGN—STUDIO (MATERIALS AND PRODUCTION PROCESSES) (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● select, organize and manage a production team ● prepare a written submission describing the production process used, indicating key elements of that process and the management task (optionally supported by illustrations, photographs, etc.). 	Some students will be natural organizers and managers while others will need to learn these skills. Taking on different collaborative roles will help students recognize their ability and the areas requiring development.
Applied Problem Solving	<ul style="list-style-type: none"> ● solve a design problem involving the production of a designed product in quantity ● identify the problem, write a project brief and prepare a plan for resolution ● select and use appropriate tools and materials as outlined in the project brief ● rationalize the selection of materials used in the design project based on their physical properties. 	<p>Some students may want to produce several simple products; others may want to produce a single, more complex product.</p> <p>Advanced level students must be able to select and use appropriate materials and equipment and rationalize their selection.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) ● maintain a portfolio of ongoing design activity, which might in this module include samples of items reproduced as part of the module activity (e.g., actual items, photographs or video of item in production and final product, written submission detailing production activity) and appropriate supplementary material. 	See notes from other 2-D Design Studio modules.

MODULE DES304: 3-D DESIGN—STUDIO (FORM, COMPOSITION AND AESTHETICS)**Level:** Advanced**Theme:** Design Skills, Processes and Applications**Prerequisite:** 3-D Design—Applications (DES202; Recommended)**Module Parameters:** No specialized equipment or facilities required

Students deal with such aspects as shaping, massing, proportion, scale, contrast, colour, texture and finish within the context of complex three-dimensional design projects.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● produce advanced level designed solutions 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● resolution of a teacher- and/or student-specified advanced level three-dimensional project brief. <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	30
<ul style="list-style-type: none"> ● use the elements, principles, and considerations common to three-dimensional composition 	<ul style="list-style-type: none"> ● selection and effective use of elements and principles of design in project work. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for explanation and examples of elements and principle of design</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	20
<ul style="list-style-type: none"> ● use various materials, and the processes required to shape and join these materials, to create desired forms 	<ul style="list-style-type: none"> ● selection and effective use of materials and associated processes in project work. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for examples of materials, and processes used to shape and join them</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	10

MODULE DES304: 3-D DESIGN—STUDIO (FORM, COMPOSITION AND AESTHETICS)
(continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● demonstrate familiarity with the symbolic and cultural connotations of design, and make aesthetic judgments about the design solution(s) generated ● maintain and present a design portfolio ● demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● justification of judgments made during designing with respect to aesthetics, symbolism and culture, brought forth within the presentation/critique. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> - the form, composition and aesthetic quality of the product, - the judgments made during the designing process, - why these were made, and - the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i></p> <ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Innovation", "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>20</p> <p>20</p> <p>Integrated throughout</p>

MODULE DES304: 3-D DESIGN—STUDIO (FORM, COMPOSITION AND AESTHETICS)

(continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none">● gain an understanding of the relationships between the objective, analytical requirements of achieving functional integrity and the more subjective, intuitive judgments involved in achieving an aesthetic expression● indicate how this understanding has informed both the designing process and the design solution.	Designs must be both functional and aesthetically pleasing. Understanding this interrelationship will help students design solutions that work and are at the same time elegant. It will also help them select processes and materials that are best suited to their designed solution.
Elements and Principles	<ul style="list-style-type: none">● identify the considerations, decisions, elements and principles of the designing process that contributed to the design solution● explain these through verbal and/or written presentation.	See notes from 2-D Design Studio modules.
Applied Problem Solving	<ul style="list-style-type: none">● address one or more three-dimensional design projects, e.g., displays, exhibits, dramatic sets, products, packaging, furniture, lighting, CD players● identify each problem through background research and general familiarization, write a project brief and prepare a plan to complete the project, which would include methodology such as objectives of the project, steps required to achieve the objectives, the proposed deliverables (e.g., drawings and model[s]) and a time schedule (e.g., a simple bar chart)● select and use appropriate materials and tools to explore concepts and to achieve the objectives outlined in the project brief.	In early stages of a project, the designing process might include sketching in two-dimensions and sketch-modelling in three dimensions to explore possibilities of form and composition in the context of the project brief. Later in the project, CADD drawings could be used to define the design and facilitate construction. Three-dimensional physical models (or in some cases, possibly CADD models) might be used to visualize the final design solution in order to deal more fully with detailing and overall aesthetics.

MODULE DES304: 3-D DESIGN—STUDIO (FORM, COMPOSITION AND AESTHETICS)
(continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving (cont'd)	<i>The student should:</i>	<p>Rendered drawings could be used to explore colour options and combinations. However, design problem solving is rarely a stepwise process and iterations will often continue into the final stages of the project.</p> <p>See notes from 2-D Design Studio modules.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) ● maintain a portfolio of ongoing design activity, which in this module would include samples of items produced and/or photographs or video of items produced. 	See notes from 2-D Design Studio modules.

MODULE DES305: 3-D DESIGN—STUDIO (COMMUNICATION AND HUMAN FACTORS)

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: 3-D Design—Studio (Form, Composition and Aesthetics) (DES304; Recommended)

Module Parameters: No specialized equipment or facilities required

Students are introduced to human factors and considerations in designed artifacts, including ergonomics, semantics and semiotics.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● apply human factors, principles and considerations (i.e., ergonomics, semantics, semiotics) in the designing process, which results in a three-dimensional product for human use ● account for relationship between the application of human factors, principles and considerations and the articulation (system, sequence) of a product design 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● resolution of a teacher- and/or student-specified advanced level three-dimensional project brief. <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p> <ul style="list-style-type: none"> ● justification of judgments made during designing with respect to human factors and the designed solution, brought forth within the presentation/critique. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	<p>60</p> <p>20</p>

MODULE DES305: 3-D DESIGN—STUDIO (COMMUNICATION AND HUMAN FACTORS)
(continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> - the form, composition and aesthetic quality of the product, - the judgments made during the designing process, - why these were made, and - the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● select at least three examples of commercially produced products and consider, analyze and describe the human factors aspects of the designs. Identify the elements that are judged to be appropriately resolved in the designs, and those that could be improved. Make suggestions for how improvements could be effected 	Design is done for a purpose. It is important that students realize that products are designed to meet a client's needs. Well-designed products will have a greater chance of success than poorly designed products. Students must recognize this, both as designers and as consumers of design.

MODULE DES305: 3-D DESIGN—STUDIO (COMMUNICATION AND HUMAN FACTORS)
(continued)

Concept	Specific Learner Expectations	Notes
Skills Development (cont'd)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> provide at least three examples of how human factors (e.g., physical, mental, emotional, psychological, ethical cultural) can affect three-dimensional design; e.g., size of products in relation to human anatomy, toys or games of different materials or with different levels of complexity depending on the intended age group, the shape or orientation of a building and its relationship to cultural conventions and expectations. 	The impact of design on the social, psychological, emotional and physical well-being of people must be recognized by students and taken into account in their design work.
Applied Problem Solving	<ul style="list-style-type: none"> address one or more three-dimensional design projects; e.g., furniture, hand-tools, interfaces for electronic equipment (e.g., for a photocopier, a radio or personal stereo), control design (e.g., for a shower), design for users with special needs (e.g., seniors, wheelchair users, extraordinary work environment), signage, eye glasses, clothes, shoes, toys, board games, sports equipment, architectural elements, such as entrances, public/private spaces identify the human factors considerations to be addressed, write a design brief and prepare a plan to complete the project, which would include methodology such as objectives of the project, steps required to achieve the objectives (which might include user testing of ideas with a survey group), the proposed deliverables (e.g., drawings and model[s]) and a time schedule (e.g., a bar chart) select and use appropriate materials and tools to explore concepts and to achieve the objectives outlined in the project brief. 	See notes from 2-D Design Studio modules.
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) and 3-D Design—Studio (Form, Composition and Aesthetics). 	Advanced students should be able to lead a critique session. They should be given opportunity to do so at some point in their advanced level program.

MODULE DES306: 3-D DESIGN—STUDIO (MATERIALS AND PRODUCTION PROCESSES)

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: 3-D Design—Studio (Form, Composition and Aesthetics) (DES304; Recommended)

Module Parameters: No specialized equipment or facilities required

Students expand their knowledge of the materials used for the production of products, and the technologies and production processes employed to shape and join materials and to assemble products. They will become familiar with the principles of manufacturing, and the materials, technologies and processes appropriate for manufacturing a product in various production quantities.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● use materials, technologies and production processes relevant to a particular area of three-dimensional design to produce a product	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● resolution of a teacher- and/or student-specified advanced level three-dimensional project brief. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	40
<ul style="list-style-type: none">● apply appropriate processes to form, shape, join, fasten, assemble and/or construct with various materials based on their properties	<ul style="list-style-type: none">● selection and effective use of materials and associated processes in project work. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for examples of materials, and processes used to shape and join them</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20
<ul style="list-style-type: none">● describe the relationship between the materials, production processes and intended production quantities, and the way a product is designed	<ul style="list-style-type: none">● justification of the selection/recommendation of materials and production processes, and the proposed quantities to be reproduced, brought forth within the presentation/critique. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20

MODULE DES306: 3-D DESIGN—STUDIO (MATERIALS AND PRODUCTION PROCESSES) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the quality of the product, and the student's discourse regarding: <ul style="list-style-type: none"> - the strengths and weaknesses of the designed solution, and - the justification for the selection and use of materials for the designed solution, recommendation for production process(es), and quantities to be reproduced. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Managing Resources", "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● select an appropriate production process for the design proposal. Study and describe the stages in the production system, the roles of the various members of the production team that contribute to the process; e.g., economists, engineers, production managers, marketing specialists ● describe the organizational and management aspects that are required to put a product into production. 	

MODULE DES306: 3-D DESIGN—STUDIO (MATERIALS AND PRODUCTION PROCESSES) (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	<p><i>The student should:</i></p> <ul style="list-style-type: none"> engage in a project that requires the design of a product for quantity production ("quantity" could range from 5 products to > 10,000 products depending on the nature of the projects). The materials and processes selected will be dependent on the intended quantities to be (theoretically) produced; e.g., furniture, kitchen appliances, electronic products, jewellery, clothing, architectural elements, such as mouldings, fittings and fixtures, toys, sports equipment identify the materials and production considerations to be addressed, write a project brief and prepare a plan to complete the project, which would include methodology such as objectives of the project, intended production quantities, steps required to achieve the objectives (which might include consultations with manufacturers), the proposed deliverables (e.g., drawings and model[s]) and a time schedule (e.g., a bar chart) select and use appropriate materials and tools to explore concepts and to achieve the objectives outlined in the project brief rationalize the selection of materials used in the design based on their physical properties, the intended quantities to be produced, the relationship to the project requirements and the production processes specified. Describe alternative materials and processes that might be appropriate for the production of the design in smaller and/or larger quantities. 	<p>The processes used to produce products are many and varied. It is important that students understand that product manufacturing is a system of occurrences that are "designed". By studying various manufacturing processes, students will see how a product is manufactured, the steps within the system and the impact on the materials used in the process. They must also consider the environmental impact of the process.</p> <p>It may be possible for students to test various materials as part of their selection process.</p> <p>It may be possible for students to visit a manufacturing site or to simulate a manufacturing situation.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) and 2-D Design—Studio (Materials and Production Processes). 	

MODULE DES307: LIVING ENVIRONMENTS—STUDIO (HUMAN AND ENVIRONMENTAL NEEDS)

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: The Design Process (DES102; Recommended)

Module Parameters: No specialized equipment or facilities required

The student learns to develop appropriate design solutions for specific human needs through architectural, environmental or interior design. The student learns to utilize design methodology and teamwork in the development of these solutions.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● devise creative designed solutions based in architectural, environmental and/or interior design, that address human and/or environmental needs	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● resolution of a teacher- and/or student-specified advanced level Living Environments project brief. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	50
<ul style="list-style-type: none">● use elements, principles and processes of design to deal with identified human and/or environmental needs within design solutions	<ul style="list-style-type: none">● selection and effective use of elements and principles of design in project work. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for explanation and examples of elements and principles of design</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	10
<ul style="list-style-type: none">● describe ways human and environmental requirements affect design	<ul style="list-style-type: none">● presentation of ideas on the relationship of human and environmental needs and design through writing and/or through discourse during the presentation/critique. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20

MODULE DES307: LIVING ENVIRONMENTS—STUDIO (HUMAN AND ENVIRONMENTAL NEEDS) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p>The student will:</p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> – how human and environmental needs have been addressed through the designed solution, – the judgments made during the designing process, – why these were made, and – the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● consider how the environment has a direct impact in design; e.g., extreme climates, delicate environments, toxic environments ● present at least three examples of the impact of a living environment on human beings; e.g, the impact of different parts of the school on what people are able to do, different behavioural responses to the atmosphere of a fast food restaurant and a formal dining restaurant, the effect of different types of furniture on a person's activity level 	<p>Many designs meet specific environmental needs. For example, the needs of people (e.g., food, shelter, clothing, association) are fairly constant but how they are met in a house, shopping mall, park, desert, space or under the ocean are quite different. Students must recognize these differences and design for them.</p>

MODULE DES307: LIVING ENVIRONMENTS—STUDIO (HUMAN AND ENVIRONMENTAL NEEDS) (continued)

Concept	Specific Learner Expectations	Notes
Skills Development (cont'd)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> provide at least three examples of how human factors (e.g., physical, mental, ethical, culture) can affect architectural, environmental or interior design (e.g., size of doorways, temperature controls, colour selections) consider the responsibility design has toward the human and natural environment. 	
Elements and Principles	<ul style="list-style-type: none"> identify and use the elements and principles of design, and processes associated with design, as they apply to projects in interior, architectural and/or environmental design. 	
Applied Problem Solving	<ul style="list-style-type: none"> conduct an evaluation and user survey of human environmental needs with respect to specific projects in interior, architectural and/or environmental design address at least two different design problems; e.g., an entrance to a building such as a museum, interpretive centre, or drop-in centre for seniors, a playground within a public park identify each problem, write a project brief and structure a plan for resolution select and use appropriate tools and materials as outlined in the project brief. 	<p>The interrelated aspect of the Living Environments modules and their close relationship to other design areas should be stressed. Students should be aware that at this advanced level idea development and presentation, collaborative work and directed individual study are crucial to the design process. These are also good modules for related field trips, and the development of contacts with professionals, manufacturers and suppliers.</p> <p>Form, materials and production processes may be considered at this stage though not necessarily resolved.</p> <p>See notes from 2-D Design Studio and 3-D Design Studio modules.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) 	See notes from 2-D Design Studio and 3-D Design Studio modules.

MODULE DES308: LIVING ENVIRONMENTS—STUDIO (FORM AND SPACE)**Level:** Advanced**Theme:** Design Skills, Processes and Applications**Prerequisite:** Living Environments—Studio (Human and Environmental Needs) (DES307; Recommended)**Module Parameters:** No specialized equipment or facilities required

The student learns to consider form and space when developing specific architectural, environmental or interior design solutions specific to human and/or environmental needs. The student assesses solutions on the basis of functional and aesthetic considerations and appropriateness within the human environment. Materials and production processes may be considered at this stage though not necessarily resolved. When designing at the micro level, students consider the ergonomic aspects of design.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> address advanced level problems in one or more Living Environment themes (architectural design, environmental design, interior design) 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> resolution of a teacher- and/or student-specified advanced level Living Environments project brief. <p><i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	50
<ul style="list-style-type: none"> apply elements and principles of design (e.g., space, form) and ergonomics within architectural, environmental, and/or interior design 	<ul style="list-style-type: none"> selection and effective use of elements and principles of design in project work. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for explanation and examples of elements and principle of design</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	10
<ul style="list-style-type: none"> make rational judgments with respect to aesthetic quality in architectural, environmental or interior design 	<ul style="list-style-type: none"> justification of judgments made during designing with respect to aesthetic quality of the designed solution, brought forth within the presentation/critique. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	20

MODULE DES308: LIVING ENVIRONMENTS—STUDIO (FORM AND SPACE) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> how human and environmental needs have been addressed through the designed solution, the judgments made during the designing process, why these were made, and the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Innovation", "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE DES308: LIVING ENVIRONMENTS—STUDIO (FORM AND SPACE) (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● consider how form and space are used in the context of architectural, environmental and interior design ● conduct research to compare the living and working spaces of two communities that differ in some way; e.g., climatically, socio-economically, culturally ● identify one example drawn from architectural, environmental or interior design (e.g., a frame construction house from Canada and a house from Japan) and compare them ● consider the responsibility design has toward the human and natural environment. 	Design cuts across our living environments structuring the macro living spaces (e.g., buildings, parks) and the micro living spaces (e.g., rooms, offices). We look for different things from design in each case. In macro space projects, the overall form, aesthetics, structural integrity and function are key components. In micro space projects, we must also consider ergonomic factors.
Elements and Principles of Design	<ul style="list-style-type: none"> ● identify the elements and principles of design used in the solution of each design problem and explain how their use has contributed to the aesthetics and function of the solution. 	
Applied Problem Solving	<ul style="list-style-type: none"> ● identify and resolve a design problem in the area(s) of architectural, environmental and/or interior design; e.g., a personal living space, a living space for an extreme environment, a commercial space, a park, a restaurant, a prefabricated living space with components that can be assembled on location, a survival shelter ● identify each problem, write a project brief and structure a plan for resolution ● select and use appropriate tools and materials as outlined in the project brief ● rationalize decisions made during designing and indicate how these decisions affected the aesthetic quality of the solution. 	See notes from 2-D Design Studio and 3-D Design Studio modules.
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics). 	See notes from 2-D Design Studio and 3-D Design Studio modules.

MODULE DES309: LIVING ENVIRONMENTS—STUDIO (MATERIALS AND PRODUCTION PROCESSES)

Level: Advanced

Theme: Design Skills, Processes and Applications

Prerequisite: Living Environments—Studio (Human and Environmental Needs) (DES307; Recommended)

Module Parameters: No specialized equipment or facilities required

The student develops design solutions specific to architectural, environmental or interior design; learning about, utilizing and/or specifying appropriate materials and production processes.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● use appropriate materials and production processes in resolving set design problems	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● selection and effective use of materials and associated processes in the resolution of a teacher- and/or student-specified advanced level Living Environments project brief. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for examples of materials, and processes used to shape and join them</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	40
<ul style="list-style-type: none">● identify materials and products used in architectural, environmental, and/or interior design, and give reasons for their use based on their properties	<ul style="list-style-type: none">● demonstration of understanding of the relationship of materials and products and their use through writing and/or through discourse during the presentation/critique. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for examples of materials</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	20

MODULE DES309: LIVING ENVIRONMENTS—STUDIO (MATERIALS AND PRODUCTION PROCESSES) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● identify and/or specify production processes, and/or methods for manufacturing products common to architectural, environmental, and/or interior design ● maintain and present a design portfolio ● demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● justification of the selection/specification of materials and production processes for product manufacturing through writing and/or through discourse during the presentation/critique. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> - his or her understanding of the relationship between materials and products and their use, and - his or her justification for the selection/specification of materials and production processes for product manufacturing. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p> <ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Managing Resources", "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>20</p> <p>20</p> <p>Integrated throughout</p>

MODULE DES309: LIVING ENVIRONMENTS—STUDIO (MATERIALS AND PRODUCTION PROCESSES) (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● identify materials, production processes and techniques commonly used in construction, fabrication and the finishing of living and working spaces ● consider the nature of different materials (e.g., woods, metals) and how their use has evolved in design (e.g., structural design, furniture design) ● consider how traditional materials (e.g., woods) have been replaced by other materials (e.g., plastics) in the living environment ● specify and rationalize the materials and production processes used in the design solution. 	Designers use a variety of materials to create structures, fixtures, furnishing, etc. As new materials become available, they are evaluated for their properties, then used where and when appropriate. Often the same material is used for a variety of purposes with new uses evolving as design evolves. Students should recognize and examine how various materials are used and have been used in design. This knowledge will give them a basis for selecting appropriate materials for their own projects.
Applied Problem Solving	<ul style="list-style-type: none"> ● experiment with materials and production processes specific to a project ● specify at least two different material and production scenarios specific to the same design project ● specify materials and production processes that contribute to the structure and to the durability of a design ● resolve construction concerns implicit in the requirements of form, space and ergonomics ● identify each problem, write a project brief and structure a plan for resolution ● select and use appropriate tools and materials as outlined in the project brief. 	
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) and 3-D Design—Studio (Materials and Production Processes). 	See notes from 2-D Design Studio and 3-D Design Studio modules.

MODULE DES310: COMPUTER AIDED DESIGN AND MODELLING—STUDIO**Level:** Advanced**Theme:** Drafting for Design and Technical Drawing Skills**Prerequisite:** CADD—Applications (DES203; Recommended)**Module Parameters:** CADD software

Students solve design problems using advanced Computer Aided Design and Drafting (CADD) methods, utilizing advanced commands, three-dimensional modelling techniques, rendering, shading and animation techniques.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● use advanced Computer Aided Design and Drafting (CADD) commands and techniques to design working prototypes of solutions to advanced level design problems	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● production of still and/or animated images based on advanced level design brief and using teacher-specified software. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>General CADD Assessment Rubric (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	80

MODULE DES310: COMPUTER AIDED DESIGN AND MODELLING—STUDIO (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding: <ul style="list-style-type: none"> - the software used, - his or her justification for the selection/use of the software, and - the process used to achieve the product (e.g., collaboration). <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Communication" and "Teamwork and Leadership". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● identify, select and use appropriate CADD and related software (e.g., three-dimensional modelling software) in the context of design ● generate a three-dimensional model image and/or working drawings on a computer in response to a problem specified in a project brief, and print work generated. 	<p>Teachers may provide students with several options for computer software they may use. Also see the related learner expectations in 3-D Design Studies (Form, Composition and Aesthetics).</p> <p>Students should be made aware that time is an important factor in using CADD and that they should become faster and more efficient with each project.</p>

MODULE DES310: COMPUTER AIDED DESIGN AND MODELLING—STUDIO (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● apply the personal computer and specified CADD software to resolve problems as outlined in project briefs. 	Students should have had previous experience in CADD and feel confident in using the chosen software independently in this module. They should share CADD techniques, tips and hints to their advantage in the process of solving problems. By allowing sharing to take place, teachers and students will learn and improve their CADD techniques.
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) ● maintain and update a portfolio as described in 2-D Design—Studio (Form, Composition and Aesthetics). Additions from this module would include all project related material (e.g., sketches, notes, a computer disk containing images produced through CADD and three-dimensional modelling software, hard copies of these images), the design journal, and appropriate supplementary material. 	As with the other CADD modules, students might produce portfolio of their work on a computer disk and support this with selected still images (printed or plotted) and/or a video tape of selected images.

MODULE DES311: DRAFTING FOR DESIGN—STUDIO (BASE DRAWINGS)**Level:** Advanced**Theme:** Drafting Design and Technical Drawing Skills**Prerequisite:** Drafting for Design—Applications (DES204; Recommended)**Module Parameters:** CADD software optional

Students concentrate on various drawing and drafting types to illustrate design concepts and solutions. These might include freehand drawings, illustrative views, isometric drawings, perspective drawings, axiometric drawings, surface developments (flat pattern). This is a skill-building module with the emphasis on line drawing.

Note: Completed drawings from this module may be used as preparatory material for subsequent Drafting for Design Studio or Technical Drawing Studio modules.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● use freehand and mechanical and/or computer aided drafting techniques in addressing complex projects in such areas as architecture, fashion, product, furniture and/or other design applications	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● production of “line” pictorial drawings within the context of a teacher- and/or student-specified advanced level assignment. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	50
<ul style="list-style-type: none">● apply various drawing construction principles through pictorial drawings such as isometric, perspective and axiometric	<ul style="list-style-type: none">● selection and application of freehand, mechanical and computer aided techniques in the production of illustrative pictorial drawings of designed solutions. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	10

MODULE DES311: DRAFTING FOR DESIGN—STUDIO (BASE DRAWINGS) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● address design detailing, making rational judgments with respect to proportion, scale, composition, codes and standards ● maintain and present a design portfolio ● demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● accuracy and precision of drawings and of detailing and notations for drawings. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for examples</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	<p>20</p>
	<ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing styles chosen, and the student's discourse regarding: <ul style="list-style-type: none"> - the adequacy of the drawings for illustrating the designed solution, - the judgments made during the assignment, - why these were made, and - the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Design Studies Assessment Video</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p> <ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>20</p> <p>Integrated throughout</p>

MODULE DES311: DRAFTING FOR DESIGN—STUDIO (BASE DRAWINGS) (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● achieve competency in at least two different drawing types such as isometric and perspective to illustrate complex design concepts and solutions. Drawings are to be completed as line drawings only; i.e., no surface textures, shading, etc. ● achieve competency in freehand drawing construction techniques; e.g., accuracy in proportion and scale using freehand perspective grids, underlay isometric grids, etc. ● achieve competency in instrument and/or computer aided design techniques for construction of accurate, illustrative views of design solutions ● select and use appropriate drawing instruments, materials, computer applications. 	This may be drawing existing objects (e.g., calculator, house, running shoe) or design work from previously completed or current design studio modules (e.g., a furniture design, bird house, backpack, kitchen interior).
Applied Problem Solving	<ul style="list-style-type: none"> ● address problems of design detailing during drawing projects, with attention to such aspects as proportion, scale, composition, codes and standards (as applicable). 	
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) ● maintain and update a portfolio as described in 2-D Design—Studio (Form, Composition and Aesthetics). Additions from this module would include all project related material (e.g., sketches, notes, drawings completed by hand or with computer assistance), the design journal, and appropriate supplementary material. 	Assemble a set of high quality, illustrative line drawings from each assignment or project, for inclusion in a portfolio or for further development in other modules.

MODULE DES312: DRAFTING FOR DESIGN—STUDIO (EXPLANATORY DRAWINGS)**Level:** Advanced**Theme:** Drafting for Design and Technical Drawing Skills**Prerequisite:** Drafting for Design—Studio (Base Drawings) (DES311; Recommended)**Module Parameters:** CADD software optional

Complex explanatory drawings are developed from base (line) drawings, including exploded views, cut-aways, revolutions, sectional, and shadow and reflection construction. Further development of drawings and/or drawing types begun in Drafting for Design—Studio (Base Drawings) may also be included. This is a skill-building module with the emphasis on explanatory line drawings.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">• use explanatory drawing techniques (e.g., exploded views, cut-away views, shadow and reflection construction) to convey and communicate complex design solutions	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">• production of pictorial drawings within the context of a teacher- and/or student-specified advanced level assignment. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	50
<ul style="list-style-type: none">• use appropriate drawing techniques to illustrate principles of assembly, mechanical function, usage, etc.	<ul style="list-style-type: none">• selection and application of freehand, mechanical and/or computer aided techniques in the production of illustrative pictorial drawings of designed solutions. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	10

MODULE DES312: DRAFTING FOR DESIGN—STUDIO (EXPLANATORY DRAWINGS)
(continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • address principles of communication through illustrative drawing and detailing (e.g., attention to the composition of exploded views, optimizing location of cut-away sections) • maintain and present a design portfolio • demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> • communicative impact of illustrations based on the point(s) of view selected and illustrated. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Authorized resources for examples</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p> <ul style="list-style-type: none"> • maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing styles chosen, and the student's discourse regarding: <ul style="list-style-type: none"> - the adequacy of the drawings for explaining and detailing the designed solution, - how principles of communication have been applied within the drawings, - judgments and decisions made during drawing, why these were made, and - the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p> <ul style="list-style-type: none"> • observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>20</p> <p>20</p> <p>Integrated throughout</p>

MODULE DES312: DRAFTING FOR DESIGN—STUDIO (EXPLANATORY DRAWINGS)
(continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● take existing drawings such as isometric or perspective views (from other modules or preselected by teacher) and develop a set of explanatory drawings (e.g., exploded, cut-aways, sections), which effectively communicate aspects of the design solution such as its assembly, function, use. Examples include exploded view of a hair dryer, cut-away of a running shoe, functions of spaces in a house, traffic circulation in public spaces ● achieve competency in freehand explanatory techniques; e.g., accuracy in proportion and scale using freehand perspective grids, underlay isometric grids 	
Skills Development	<ul style="list-style-type: none"> ● achieve competency in instrument and/or computer aided design techniques for producing accurate explanatory views of design solutions ● select and use appropriate drawing instruments, materials, computer applications, as required. 	
Applied Problem Solving	<ul style="list-style-type: none"> ● assess and apply the best way to illustrate the assembly, function and/or use of a design solution through examination of the design, sketchbook exploration, peer and teacher discussion, and through examination of existing successful examples. 	
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) and Drafting for Design—Studio (Base Drawings). 	Assemble a set of high quality explanatory drawings from each assignment or project, for inclusion in a portfolio or for further development in other modules such as Drafting for Design—Studio (Rendering and Presentation Techniques).

MODULE DES313: DRAFTING FOR DESIGN—STUDIO (RENDERING AND PRESENTATION TECHNIQUES)

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: Drafting for Design—Studio (Base Drawings) (DES311; Recommended)

Module Parameters: CADD software optional

Rendering techniques are applied to line drawings (base or developed), with attention to light, colour and various media (coloured pencils, marker pens, water colours, computer rendered, etc.). Emphasis is on rendering.

Presentation techniques are used to compose high quality illustrations to communicate design solution, using rendered drawings, context backgrounds, collage and montage techniques, titles, text, etc. Emphasis is on visual presentation.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● use various rendering techniques and media to create high quality visual representations of design solutions	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● production of high quality rendered drawings within the context of a teacher- and/or student-specified advanced level assignment. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	60
<ul style="list-style-type: none">● create well-composed presentations of design solutions using a combination of materials and methods, such as rendered drawings, photographs, text, theme boards, CADD, video, etc.	<ul style="list-style-type: none">● presentation of products for public display and discourse during presentation/critique. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i>	20

MODULE DES313: DRAFTING FOR DESIGN—STUDIO (RENDERING AND PRESENTATION TECHNIQUES) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing/rendering styles chosen, and the student's discourse regarding: <ul style="list-style-type: none"> - the adequacy of the drawings/renderings for illustrating the design, - the adequacy of the presentation for displaying the drawings/renderings and communicating their message, - judgments and decisions made during drawing and why these were made, and - the effect they had in shaping the final result. <p><i>Assessment Tools</i></p> <p><i>Reference Set for Advanced Level (to be developed)</i></p> <p><i>Design Studies Drafting/or Design and Technical Drawing Rubric—Pictorial Drawing (DESRBC-2)</i></p> <p><i>Design Studies Project Assessment Guide (DESAGD)</i></p> <p><i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i></p> <p><i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE DES313: DRAFTING FOR DESIGN—STUDIO (RENDERING AND PRESENTATION TECHNIQUES) (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● take existing drawings such as isometric or perspective views, exploded views or cut-aways from other modules, (e.g., Drafting for Design—Studio modules) or preselected by the teacher, and develop a set of rendered drawings using appropriate tools and materials (e.g., water colour, marker pens, CADD), which effectively communicates aspects of the design solution such as its general appearance, textures, materials, the design in context, the design under different lighting conditions. Examples include colour possibilities for a telephone design, rendered cut-away of a running shoe to show internal materials, entrance of a townhouse project, cut-away of a restaurant to show utilities ● achieve competency in at least two rendering techniques; e.g., pencil and computer rendering ● explore, select and use materials, computer applications, as appropriate ● compose high quality illustrations using rendered drawings, context backgrounds, photographs, collage and montage techniques, titles, text, etc., for visual presentation of design solutions. Examples include: <ul style="list-style-type: none"> – a well-composed board comprising a rendering of a lawn mower, partial exploded view to show internal workings, a photograph illustrating the product context, informative text and a title – an architectural illustration board comprising rendered elevations, sections and plans, text and titles – a sequence of rendered CADD images. 	

MODULE DES313: DRAFTING FOR DESIGN—STUDIO (RENDERING AND PRESENTATION TECHNIQUES) (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● assess and apply the best way of rendering a drawing of a design solution through examination of the design, sketchbook exploration, peer and teacher discussion and through examination of existing successful examples ● assess and apply the optimum way of presenting the design solution in a two-dimensional visual format, which may include CADD modelling (but does not include three-dimensional physical models). 	
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) and Drafting for Design—Studio (Base Drawings). 	<p>Maintain a sketchbook of rendering techniques, examples of various media, etc.</p> <p>Assemble a set of high quality illustrations in a presentation format from each assignment or project, for inclusion in a portfolio.</p>

MODULE DES314: TECHNICAL DRAWING—STUDIO (SECTIONS, ELEVATIONS AND AUXILIARY VIEWS)

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisites: Technical Drawing—Applications (DES205; Recommended)

Module Parameters: CADD software optional

Students build upon their learning from the intermediate level. They may use previously produced sketches and multiview drawings as a basis for further work. The focus of this module is on the production of sections, elevations and auxiliary drawings.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● produce detailed section, elevation and auxiliary views for fabrication, manufacturing and/or construction	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● production of a set of detailed technical drawings based on an advanced level assignment and including one of each of the following:<ul style="list-style-type: none">– section,– elevation, and– auxiliary. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	70
<ul style="list-style-type: none">● attend to codes, specifications and conventions in the drawings produced	<ul style="list-style-type: none">● identification and application of codes and specifications, standards and conventions as they pertain to the project and as determined by the teacher and/or other qualified individual. <i>Assessment Tools</i> <i>Local, regional, provincial, national and international reference manuals for codes and standards</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	10

MODULE DES314: TECHNICAL DRAWING—STUDIO (SECTIONS, ELEVATIONS AND AUXILIARY VIEWS) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a drawing portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing types, and the student's discourse regarding: <ul style="list-style-type: none"> - the adequacy of the drawings for illustrating the designed solution, - the judgments made during the assignment, - why these were made, and - the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● increase proficiency with skills and techniques learned at the intermediate levels ● identify and use additional techniques, tools material and other resources as required in projects undertaken ● produce at least one section view, one elevation and one auxiliary view within the context of the drawings being produced. 	Students should select the appropriate techniques and procedures to meet the needs of the project they engage in. The teacher's role will be to help them choose wisely and to guide rather than direct their design activity.

MODULE DES314: TECHNICAL DRAWING—STUDIO (SECTIONS, ELEVATIONS AND AUXILIARY VIEWS) (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● from sketches and/or multiview drawing prepared in previous modules or provided by the teacher, identify and select appropriate additional views and produce them ● accurately indicate dimensions as required ● employ codes, specifications and conventions as required ● select and use appropriate tools and materials. 	<p>Students may work in several different contexts in this module including electrical, plumbing, process piping and manufacturing. Students may use traditional drafting equipment, CADD or other technology specified by the teacher to complete the module.</p> <p>Electrical or plumbing systems, process piping systems, molds for cast products, machined gear systems and manufacturing jigs can form the basis for this module.</p> <p>Teachers may choose to teach sections, elevations and auxiliary views through projects specific to this module and/or through longer term projects that will carry on into other modules.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) and Drafting for Design—Studio (Base Drawings). 	See notes from other Studio modules.

MODULE DES315: TECHNICAL DRAWING—STUDIO (DEVELOPMENTS AND INTERSECTIONS)

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisite: Technical Drawing—Studio (Sections, Elevations and Auxiliary Views) (DES314; Recommended)

Module Parameters: CADD software optional

Within fabrication, manufacturing and/or construction there is a need to clearly identify and specify details of various product components. Students focus on representations of developments (e.g., sheet metal flashing, clothing patterns) and intersections (e.g., the intersection of two heating ducts).

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● produce surface developments and intersections for fabrication, construction and/or manufacturing	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● production of a set of detailed technical drawings based on an advanced level assignment and including one of each of the following:<ul style="list-style-type: none">– surface development, and– intersection. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	60
<ul style="list-style-type: none">● produce drawings for different applications (e.g., heating ducting, tent manufacturing, outerwear manufacturing) and representing different materials (e.g., sheet metal, plastic, canvas, wool)	<ul style="list-style-type: none">● production of drawings to meet specific requirements. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	10

MODULE DES315: TECHNICAL DRAWING—STUDIO (DEVELOPMENTS AND INTERSECTIONS) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> attend to codes, specifications and conventions in the drawings produced 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> identification and application of codes and specifications, standards and conventions as they pertain to the project and as determined by the teacher and/or other qualified individual. <p><i>Assessment Tools</i> <i>Local, regional, provincial, national and international reference manuals for codes and standards</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i></p>	<p>10</p>
<ul style="list-style-type: none"> maintain and present a design portfolio 	<ul style="list-style-type: none"> maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the selection, use and technical execution of drawing types, and the student's discourse regarding: <ul style="list-style-type: none"> the adequacy of the drawings for illustrating the designed solution, how the specific requirements of materials and applications have been met in the drawings, judgments made during the assignment and why these were made, and the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	<p>20</p>
<ul style="list-style-type: none"> demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

MODULE DES315: TECHNICAL DRAWING—STUDIO (DEVELOPMENTS AND INTERSECTIONS) (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● produce at least two examples of each of the following within the drawings produced: <ul style="list-style-type: none"> – intersections – surface developments ● from sketches and/or multiview drawings prepared in previous modules or provided by the teacher, produce additional drawings appropriate to the design's requirements ● accurately indicate dimensions as required ● employ codes, specifications and conventions as required ● select and use appropriate tools and materials. 	See notes from other Technical Drawing modules.
Applied Problem Solving	<ul style="list-style-type: none"> ● produce drawings that take into account different materials and applications. 	
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) and Drafting for Design—Studio (Base Drawings). 	See notes from other Studio modules.

MODULE DES316: TECHNICAL DRAWING—STUDIO (FINISHED WORKING DRAWINGS)

Level: Advanced

Theme: Drafting for Design and Technical Drawing Skills

Prerequisites: Technical Drawing—Studio (Sections, Elevations and Auxiliary Views) (DES314; Recommended)

Module Parameters: CADD software optional

Working drawings are required to clearly diagram and illustrate the design specifications for a product, structure and/or process. They provide the basis for fabrication, manufacturing and/or construction. Students complete a set of working drawings for a self-generated or teacher-specified designed item.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● produce a complete set of working drawings for a student-generated or teacher-specified designed item	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● production of a complete set of detailed working drawings based on an advanced level assignment. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	70
<ul style="list-style-type: none">● attend to codes, specifications and conventions as in the drawings produced	<ul style="list-style-type: none">● identification and application of codes and specifications, standards and conventions as they pertain to the project and as determined by the teacher and/or other qualified individual. <i>Assessment Tools</i> <i>Local, regional, provincial, national and international reference manuals for codes and standards</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	10

MODULE DES316: TECHNICAL DRAWING—STUDIO (FINISHED WORKING DRAWINGS) (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the technical execution and completeness of the drawing types, and the student's discourse regarding: <ul style="list-style-type: none"> – the intent and purpose of the drawing, – how specific requirements have been met within the drawings, – judgments made during the assignment and why these were made, and – the effect they had in shaping the final result. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Drafting for Design and Technical Drawing Rubric—Multiview Drawing (DESRBC-3)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE DES316: TECHNICAL DRAWING—STUDIO (FINISHED WORKING DRAWINGS) (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● produce a complete set of working drawings for the fabrication, manufacture and/or construction of a designed item; e.g., a building, system, machined item, pre-fabricated component ● include all dimensioning details required for production ● ensure all codes are met in the specifications indicated ● select and use appropriate tools and materials as outlined in the design brief. 	See notes from other Technical Drawing modules.
Applied Problem Solving	<ul style="list-style-type: none"> ● given a design for which working drawings are to be produced, select appropriate drawing types (e.g., sections, elevations, detail drawings, assembly drawings) to satisfy the detail needs for fabrication, manufacturing and/or construction of a designed item ● rationalize the selection of materials used in the design project based on their properties. 	See notes from other Technical Drawing and Drafting for Design Studio modules.
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) and Drafting for Design—Studio (Base Drawings). 	See notes from other Studio modules.

MODULE DES317: VISUALIZING THE FUTURE**Level: Advanced****Theme: Business/Issues/History****Prerequisite: The Evolution of Design (DES206; Recommended)****Module Parameters: Library, on-line sources**

What will the role of the designer be in the future? What challenges will designers face? Students explore new possibilities in design through this module.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● identify a potential design challenge (e.g., a habitat for a space colony) and design a solution for it	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● production of drawings and/or models and/or prototypes of a designed solution. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Intermediate Level</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	60
<ul style="list-style-type: none">● provide research supporting the design	<ul style="list-style-type: none">● presentation of research in writing and/or through discourse during the presentation/critique. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Research Rubric (RESRBC)</i>	20

MODULE DES317: VISUALIZING THE FUTURE (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the degree of resolution of the project brief, and the student's discourse regarding; <ul style="list-style-type: none"> – how the project brief is resolved through the designed solution, – the strengths and weaknesses of the solution, – the judgments made during the designing processes, – why these were made, and – the effect they had in shaping the final result. <p><i>Assessment Tools (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p>	20
<ul style="list-style-type: none"> ● demonstrate effort to develop basic competencies. 	<ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Communication". <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● describe the role, and some of the challenges that will be faced by designers in the future ● indicate how this role and these challenges will differ from those currently faced by designers. 	

MODULE DES317: VISUALIZING THE FUTURE (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● write a project brief detailing the problem to be solved and structure a plan for resolution ● generate a designed solution ● conduct research in future design and apply it to the design problem ● rationalize design decisions made based on research findings. 	This module will help students consider future design possibilities. The problems identified might have to do with space or undersea exploration, medicine or genetics, high fashion or survival gear. The possibilities are endless. The important feature of this module is to provide students with the impetus to positively challenge the future and to break away from their current paradigms.
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) ● present interim findings for teacher/peer review and input ● maintain and update a portfolio as described in 2-D Design—Studio (Form, Composition and Aesthetics). Additions from this module would include all project related material (e.g., a bibliography of research sources, presentation paper, design solution, videotape of presentation), the design journal, and appropriate supplementary material. 	See notes from other Studio modules.

MODULE DES318: THE BUSINESS AND PROFESSION OF DESIGN**Level:** Advanced**Theme:** Business/Issues/History**Prerequisite:** None**Module Parameters:** Career Library

The student develops an understanding of the business aspect of the design profession including educational qualifications, opportunities in design and some of the issues and challenges designers face. Ethical, legal and social issues may be explored in this module.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">● research one area of the business/profession of design	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● demonstration of a general knowledge of the business and profession of design through project work. <i>Assessment Tools</i> <i>Sample Assignments/Project Briefs for Advanced Level (to be developed)</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Research Rubric (RESRBC)</i>	40
<ul style="list-style-type: none">● identify and consider various issues faced by designers	<ul style="list-style-type: none">● formal presentation to teachers and peers. <i>Assessment Tools</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i>	40

MODULE DES318: THE BUSINESS AND PROFESSION OF DESIGN (continued)

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> ● maintain and present a design portfolio ● demonstrate effort to develop basic competencies. 	<p><i>Assessment of student achievement will be based on:</i></p> <ul style="list-style-type: none"> ● maintenance and presentation of a module-based design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and/or peers will be placed on the presentation of research, and the student's discourse regarding: <ul style="list-style-type: none"> - his or her understanding about the business and profession of design, - issues faced by designers, and - how he or she would deal with these issues. <p><i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i></p> <ul style="list-style-type: none"> ● observations of individual effort and interpersonal interactions during the instructional period with equal emphasis on all basic competencies. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>20</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● identify three issues faced by designers and state how these issues might be dealt with in the context of a small design company ● conduct research into the business and profession of design (use reference sources, contact people working in a design field) ● determine the opportunity for a designer to practise in the immediate community and adjacent communities ● identify the qualifications required of young designers to be accepted by the design community. 	

MODULE DES318: THE BUSINESS AND PROFESSION OF DESIGN (continued)

Concept	Specific Learner Expectations	Notes
Applied Problem Solving	<p><i>The student should:</i></p> <ul style="list-style-type: none"> ● outline a plan for a small design company; e.g., identify the area of design specialty, prospective clients, production logistics, financing, promotion, etc. 	<p>This module provides an excellent opportunity for students to establish contacts in the design field of their choice. These contacts may be local, regional, provincial, national or international. Once a contact has been made, the student may be able to use this contact as a primary research source for the module. The issues faced by practitioners, their day-to-day activities and their background and training will provide the student with valuable insight into the business and profession of design.</p> <p>This module could be addressed by a design team. The team could conduct individual and/or joint research and then make a joint presentation of the findings.</p>
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> ● see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) ● present interim findings for teacher/peer review and input. 	See notes from other Studio modules.

MODULE DES319: PORTFOLIO PRESENTATION**Level:** Advanced**Theme:** Business/Issues/History**Prerequisite:** None**Module Parameters:** No specialized equipment or facilities required

Students taking this module prepare a portfolio for a specific purpose such as entry into the workplace or a post-secondary institution.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions (Draft)	Suggested Emphasis
<i>The student will</i> <ul style="list-style-type: none">● prepare a presentation portfolio for the purpose of gaining entry into the workplace and/or a post-secondary educational institution	<i>Assessment of student achievement will be based on:</i> <ul style="list-style-type: none">● quality of the portfolio. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i>	70
<ul style="list-style-type: none">● present the portfolio in an interview setting	<ul style="list-style-type: none">● preparation and presentation of a design portfolio and a design journal. Emphasis during the presentation/critique of the module-based portfolio with the teacher and peers will be placed on the scope and presentation quality of the portfolio, and the student's ability to present his or her portfolio in a professional manner. <i>Assessment Tools</i> <i>Reference Set for Advanced Level (to be developed)</i> <i>Design Studies Process Rubric (DESRBC-1)</i> <i>Design Studies Project Assessment Guide (DESAGD)</i> <i>Presentation/Reports Rubric (PRERBC)</i>	30
<ul style="list-style-type: none">● demonstrate effort to develop basic competencies.	<ul style="list-style-type: none">● observations of individual effort and interpersonal interactions during the instructional period with specific emphasis on "Communication". <i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i>	Integrated throughout

MODULE DES319: PORTFOLIO PRESENTATION (continued)

Concept	Specific Learner Expectations	Notes
Skills Development	<p><i>The student should:</i></p> <ul style="list-style-type: none"> determine the purpose of the portfolio being designed. 	<p>It is extremely important for students to be able to present a well-crafted portfolio. The portfolio should exhibit the breadth and depth of the student's capabilities, and indicate his or her academic, personal management and teamwork skills. The portfolio may take several forms and be made up of several parts (e.g., flats of two-dimensional design and photography, photographs or slides of three-dimensional work, video tape, computer disk, or any combination of the above). The student's collection of work retained during his or her studies in design will form the basis for this final presentation portfolio.</p>
Applied Problem Solving	<ul style="list-style-type: none"> select the most appropriate work for inclusion in the portfolio prepare the selected work for inclusion in the portfolio. This might include remounting and/or reworking some pieces, photographing or videotaping design work write a supporting page introducing the student and providing a listing and short description of the portfolio contents and/or provide a description of the work and rationale for the work through the video medium. 	
Presentation, Design Journal and Portfolio	<ul style="list-style-type: none"> see Specific Learner Expectations for 2-D Design—Studio (Form, Composition and Aesthetics) present completed portfolio to teacher and peers. 	<p>See notes from other Studio modules.</p>

Design Studies

ASSESSMENT TOOLS

(Revised)

Draft, June 1995

OBSERVATION CHECKLIST: BASIC COMPETENCIES

The following basic competencies (KSA) are integrated throughout the CTS program. A student's performance and growth should be assessed through observations involving the student, the teacher, peers and others. As the student progresses through the levels, he or she builds on competencies gained in earlier levels.

	Basic Competency	Stage 1	Stage 2	Stage 3
P e r s o n a l M a n a g e m e n t	Managing Learning	<i>The student will:</i> <ul style="list-style-type: none"> <input type="checkbox"/> be able to identify/locate appropriate reference/information sources <input type="checkbox"/> identify and demonstrate a variety of learning skills and tools; e.g., learning styles/preferences and strategies such as notemaking, concept mapping, etc. 	<i>The student will:</i> <ul style="list-style-type: none"> <input type="checkbox"/> apply a variety of learning styles/preferences to enhance ability to acquire new information recall and apply knowledge 	<i>The student will:</i> <ul style="list-style-type: none"> <input type="checkbox"/> draw and defend conclusions from available information <input type="checkbox"/> extract rules or principles <input type="checkbox"/> apply rules and principles to new situations
	Being Innovative	<ul style="list-style-type: none"> <input type="checkbox"/> recognize opportunities and problems <input type="checkbox"/> specify goals and constraints <input type="checkbox"/> generate alternatives <input type="checkbox"/> consider risks <input type="checkbox"/> evaluate and select best alternative 	<ul style="list-style-type: none"> <input type="checkbox"/> think critically and act logically to evaluate situations, solve problems and make decisions 	<ul style="list-style-type: none"> <input type="checkbox"/> combine ideas or information in new ways <input type="checkbox"/> make connections between seemingly unrelated ideas <input type="checkbox"/> prepare, validate and implement plans that reveal new possibilities
	Ethics	<ul style="list-style-type: none"> <input type="checkbox"/> identify appropriate ethical behaviour 	<ul style="list-style-type: none"> <input type="checkbox"/> demonstrate appropriate ethical behaviour 	<ul style="list-style-type: none"> <input type="checkbox"/> encourage and support others to demonstrate ethical behaviour
	Managing Resources	<ul style="list-style-type: none"> <input type="checkbox"/> allocate time effectively by selecting relevant, goal-related activities, ranking them in order of importance, allocating time, and preparing and following schedules. 	<ul style="list-style-type: none"> <input type="checkbox"/> allocate materials and use facilities effectively by acquiring, storing, and distributing materials, supplies, parts, equipment, space, or final products in order to make best use of them. 	<ul style="list-style-type: none"> <input type="checkbox"/> allocate human and other resources effectively by assessing knowledge and skills, distributing work and materials, evaluating performance and providing feedback.
S o c i a l I n t e r a c t i o n s	Communication	<ul style="list-style-type: none"> <input type="checkbox"/> prepare and effectively present accurate, concise written, visual and oral reports 	<ul style="list-style-type: none"> <input type="checkbox"/> communicate thoughts, feelings, and ideas to justify or challenge a position by encouraging, persuading, convincing or otherwise motivating individuals or groups 	<ul style="list-style-type: none"> <input type="checkbox"/> negotiate effectively by working towards an agreement that may involve exchanging specific resources or resolving divergent interests
	Teamwork, Leadership and Service	<ul style="list-style-type: none"> <input type="checkbox"/> participate as an effective member of a team by working cooperatively with others and contributing ideas, suggestions and effort <input type="checkbox"/> recognize and respect peoples' diversity and individual differences 	<ul style="list-style-type: none"> <input type="checkbox"/> serve clients and customers effectively by listening carefully to understand their needs and by providing as much assistance as possible to satisfy their expectations 	<ul style="list-style-type: none"> <input type="checkbox"/> lead when appropriate, mobilizing the group for high performance
	Demonstrating Responsibility (Safety and Accountability)	<ul style="list-style-type: none"> <input type="checkbox"/> demonstrate high standards in attendance and punctuality <input type="checkbox"/> be trustworthy and honest in dealing with others <input type="checkbox"/> follow safe procedures consistently and recognize and eliminate potential hazards. 	<ul style="list-style-type: none"> <input type="checkbox"/> understand and evaluate the impact on self and the organization for breaking with organizational or societal values and regulations. 	<ul style="list-style-type: none"> <input type="checkbox"/> work hard to excel at setting and meeting goals, doing tasks, setting high standards and paying attention to important details.

ASSESSMENT TOOLS

The following pages include background information and strategies for assessing student achievement, and the assessment tools that are listed in Sections D, E and F of this Guide.

This section of the Guide to Standards and Implementation has been designed to provide a common set of assessment tools that can be applied in each module in CTS throughout the province. The goal is to establish assessment standards that are fair and credible, and challenge junior and senior high school students as they proceed through the CTS program.

These tools will assist teachers throughout the province to more consistently assess student achievement. The purpose of expanding on the assessment standards is to:

- increase confidence among students, parents, business/industry and post-secondary that students can demonstrate the competencies specified in the modules they have completed
- encourage fairness and equity in how students' efforts are judged
- enable learners to focus effort on key learnings
- support teachers and community partners in planning and implementing CTS.

These tools are in draft form and are being validated between now and 1997 during the optional stage of CTS implementation.

Assessing Student Achievement in CTS

Assessing Student Achievement in Design Studies

Assessment Tools Generic to CTS

Basic Competencies Reference Guide

Assessment Tools Generic to Design Studies

DESAGD: Project Assessment Guide

DESRBC-1: Process Standards Rubric

DESRBC-2: Drafting for Design and Technical Drawing Rubric

DESRBC-3: Drafting for Design and Technical Drawing Rubric

DESTMA: Techniques, Tool, Materials and Applications Checklist

CTS-RES: Assessment Framework: Research Process

CTS-PRE: Assessment Framework: Presentations/Reports

Assessment Tools Specific to Design Studies Modules

ASSESSING STUDENT ACHIEVEMENT IN CTS

The CTS assessment standards assess two basic forms of competency:

- What a student *can do*?
 - make a product (e.g., wood bowl, report, garment)
 - demonstrate a process
 - strand-related competencies (e.g., keyboarding, hair cutting, sewing techniques, lab procedures)
 - basic competencies (e.g., resource use, safety procedures, teamwork)
- What a student *knows*?
 - knowledge base needed to demonstrate a competency (link theory and practice).

CTS Defines *Summative* Assessment Standards

The assessment standards and tools defined for the CTS modules, referenced in Sections D, E and F of this Guide, focus on the final (or summative) assessment of student achievement.

Assessment throughout the learning period (or formative assessment) will continue to assess how students are progressing. Teachers direct and respond to students' efforts to learn – setting and marking tasks and assignments, indicating where improvement is needed, sending out interim reports, congratulating excellence, etc.

Teachers will decide which instructional and assessment strategies to apply during the formative learning period. As formative and summative assessment are closely linked, some teachers may wish to modify the tools included in this section to use during the instructional process. Teachers may also develop their own summative assessment tools as long as the standards are consistent with the minimum expectations outlined by Alberta Education.

Grading and Reporting Student Achievement

When a student can demonstrate ALL of the exit-level competencies defined for the module (Module Learner Expectations), the teacher will designate the module as “successfully completed.” The teacher will then use accepted grading practices to determine the percentage grade to be given for the module—a mark not less than 50%.

The time frame a teacher allows a student to develop the exit-level competency is a local decision. **NOTE: The Senior High School Handbook specifies that students must have access to 25 hours of instruction for each credit.** Students may, however, attain the required competencies in less time and may proceed to other modules.

Teachers are encouraged to consult their colleagues to ensure grading practices are as consistent as possible.

High school teachers may wish to refer to “Directions for Reporting Student Achievement in CTS” for information on how to use the CTS course codes to report credits students have earned to Alberta Education. (Copies of this document have been forwarded to superintendents and senior high school principals.)

Components of Assessment Standards in CTS

The following components are included in each module:

- **module learner expectations** (shaded left column of the module) define the exit-level competencies students are expected to achieve to complete a module. Each MLE defines and describes critical behaviors that can be measured and observed. The student must meet the standard specified for ALL MLEs within a module to be successful. (*MLEs will not change until 1997 when minor adjustments may be made to update and clarify wording.*)

- **suggested emphasis** (right column of the module) provides a guideline for the relative significance of each MLE and can be used to organize for instruction. *(In draft until early 1997, revisions to selected modules will be distributed in June 1995 and 1996 with final revisions in June 1997.)*
- **conditions and criteria** (middle column of the module) set the framework for the assessment of student competency, specifying the minimum standard for performance and including a reference to assessment tools, where appropriate. *(In draft until early 1997, revisions to selected modules will be distributed in June 1995 and 1996 with final revisions in June 1997.)*

Conditions outline the specifications under which a student's competency can be judged. For example, the conditions could specify whether the assessment should be timed or not, or if the student should be allowed to access to support resources or references.

Criteria define the behaviors that a student must demonstrate to meet the designated standard. For example, the criteria could describe the various techniques that must be demonstrated when using a tool, and/or describe the minimum components of a project the student must complete.

Standard -The *standard* may be defined by (1) assessment tools, which are referenced in this section (or sometimes in approved learning resources) and/or (2) exemplars of student work (to be developed and distributed as "Reference Sets" in June 1997).

Assessment Tools included in this section of the Guide (e.g. checklists, rubrics/rating scales) tend to be of two types:

- tools generic to a strand or to the entire CTS program; e.g., a standard 4-point Project Assessment Scale / Rubric is used in all strands. Other generic tools being developed include assessing reports and

presentations and lab safety checklists. *(Names of these tools include the strand code (e.g., "INF" for Information Processing) and a code for the type of tool (e.g., "TDENT" for Text-Data Entry).)*

- tools specific to a module; e.g., assessment checklist for assessing a venture plan in Enterprise and Innovation or a checklist for sketching, drawing and modeling in Design Studies. *(Names of these tools include the module code; e.g., "INF101-1" indicating that it is the first module-specific tool used in Information Processing 101.)*
- Exemplars / Reference Sets : Selected examples of student work in print, audio, video and/or CD-ROM formats are scheduled to be available by June 1997. These exemplars will supplement the assessment tools and help teachers decide if a student's work is at standard, above standard, or not yet at standard.

Development and Validation Processes

The "Conditions and Criteria" and "Suggested Emphasis" columns and related assessment tools are being validated 1994-97, with extensive input from teachers, professional associations / contacts and post-secondary institutions. The goal is to prepare well-structured assessment standards and related assessment tools that:

- establish an appropriate level of challenge and rigor
- relate directly to the type of learning described in the curriculum standard
- are easy to understand
- efficient to implement
- can provide a consistent measure of what was expected to be measured.

ASSESSING STUDENT ACHIEVEMENT IN DESIGN STUDIES

The Design Studies curriculum is based on the notion of recognizable outcomes that may be compared to stated standards. In Design Studies, the standards identify students' growth in knowledge, skills and attitudes. The curriculum defines outcomes through the Module Learner Expectations (MLEs) and Specific Learner Expectations (SLEs). It also suggests criteria and conditions for assessment and the emphasis to be placed on each expectation. These elements combine to provide an overall framework for instruction and assessment.

But student growth and the assessment standards that describe this growth are brought about through several components. To get a clear picture of the growth you need to consider the increased expectations of students with respect to their ability to use a process of design or ability to produce technical drawings and renderings. You must also consider the level of maturity and intellectual and technical skill students bring to their assignments and the rigor of the projects themselves. You need to design projects that will allow student to meet the requirements of the module and are consistent with the level of the module being assigned. A projects rubric that outlines common characteristics for projects at each level has been included with this introduction for your reference. The specifics of the assignments (e.g., theme, topic, resources, tools, materials, processes, scope) are up to you.

Assessment Tools

A variety of tools have been provided for your reference and use. They are intended to

help you assess students' work as accurately and consistently as possible by stating standards of performance for elements felt to be important within the curriculum as a whole or in specific modules. They also provide standards for "basic competencies" students should be able to demonstrate while engaged in learning.

Most of the tools developed for Design Studies take the form of rubrics that state standards for specific themes across the levels of the curriculum. For example a rubric is provided for assessing students application of a seven-part process of design. Standards statements are provided at each level for each of the seven parts. Tools have also been developed for specific curricular requirements. These include two rubrics, one for assessing research activities students will engage in and a second for assessing students' presentations. These rubrics have been drawn from a pool of generic tools that have been developed for CTS. They should be used in conjunction with other project assessment tools.

Assessing Basic Competencies

Basic Competencies are those traits all students are expected to demonstrate no matter the level or context of their learning. A rubric for basic competencies, the Basic Competencies Reference Guide has been developed and is included in the assessment tools. As students progress from one stage or level to another, the expectations placed on them change and in general increase. The "basic competencies" rubrics reflect this change. A series of tools have been developed to assist you in identifying if a student has met a given basic competency. You may choose to use these directly or as a guide and assess the outcomes through some other mechanism.

DESIGN STUDIES PROJECT BRIEF RUBRIC

Project briefs will have these standard characteristics at each level:

Criteria	Introductory Level	Intermediate Level	Advanced Level
Project Brief	<ul style="list-style-type: none"> problem clearly stated in project brief 	<ul style="list-style-type: none"> problem outlined in project brief may require interpretation 	<ul style="list-style-type: none"> problem identified by student and written into design brief based on information provided by the teacher or information provided by the student
Conduct Research	<ul style="list-style-type: none"> all required background material and information is provided to the student either within the design brief or through external resources provided to the student 	<ul style="list-style-type: none"> major background information is provided but details need to be obtained by student through additional research appropriate resources are identified but not necessarily made available 	<ul style="list-style-type: none"> some background information may be provided but this would require interpretation research material to be sought by student multiple resources sought and used by student
Generate Ideas	<ul style="list-style-type: none"> examples of similar level projects are presented to provide a framework for student 	<ul style="list-style-type: none"> examples of similar level projects are presented to provide a framework for student 	<ul style="list-style-type: none"> examples of similar level projects are presented to provide a framework for student encourages challenge of assumptions, conventions and conventional boundaries
Select Most Promising Idea	<ul style="list-style-type: none"> examples of similar level projects are presented to provide a framework for student 	<ul style="list-style-type: none"> examples of similar level projects are presented to provide a framework for student 	<ul style="list-style-type: none"> examples of similar level projects are presented to provide a framework for student
Make or Model Design	<ul style="list-style-type: none"> project work is directed to meet specific learning expectations project is designed to develop specific skills with tools, materials and processes are specified projects are short in duration with relatively simple outcomes materials and tools are specified timeline is specified to ensure success 	<ul style="list-style-type: none"> project work is guided not directed project requires students to apply previously learned skills in a new context and learn new skills in a familiar context tools, materials and processes selected from limited specified list projects require consideration of two or more physical factors, processes or materials leading to a more complex outcome timeline is outlined with major benchmarks students are required to meet 	<ul style="list-style-type: none"> project work is guided not directed project requires students to select and apply previously learned skills in a new context and/or identify and learn new skills as required tools, materials and processes selected for their appropriateness to the task projects require consideration of multiple factors (e.g., physical, processes, materials, legal, ethical, environmental) leading to a more complex outcome timeline is outlined in broad terms requiring students to organize their time
Present Design to Others	<ul style="list-style-type: none"> portfolio requirements are clearly stated opportunity provided for student to discuss work with teacher 	<ul style="list-style-type: none"> portfolio requirements are clearly stated; students expected to present their work to their peers for critique 	<ul style="list-style-type: none"> portfolio requirements are clearly stated; students expected to present their work to their peers and others (e.g., clients) as required students expected to participate in a critique of their work by their peers and/or others and play an active role in critique of others' work
Evaluate Design	<ul style="list-style-type: none"> key features to be evaluated are clearly stated 	<ul style="list-style-type: none"> key features to be evaluated are clearly stated 	<ul style="list-style-type: none"> project evaluation requirements are clearly stated

Assessing Project-Based Work

The Design Studies Project Assessment Guide is a tool that can be used to assess much of the project-based work you will assign. It provides several major headings and examples of appropriate components within each heading. It also specifies

standards of performance for students at all levels using a rating scale of 0 - 4. To successfully complete a module, students are expected to meet the standard identified for the level of the module they are taking. The standard for each level has been indicated in the following chart:

Level	Standard	0	1	2	3	4
Introductory Level	below standard	x				
	at standard		X			
	above standard			x		
Intermediate Level	below standard		x			
	at standard			X		
	above standard				x	
Advanced Level	below standard			x		
	at standard				X	
	above standard					x

Please review the Design Studies Project Assessment Guide to for the "standards statements" for ratings 0 - 4. A modification of the guide that may be of use to you when assessing students' project work and a rubric describing project complexity have been included in this introduction.

Design Studies Process Rubric (DESRBC - 1)

This rubric is based on the notion that students will follow a process as they work through their projects and that this process has a number of logical steps. These steps have been organized sequentially, however, it is unlikely that students will follow this sequence specifically. Process work is *iterative* in that the steps tend to be revisited several times before the project is completed. Each time they are revisited, the project is brought closer to a satisfactory resolution. The completed project may an end in itself, it may provide a portion of a complete solution or it may be a springboard for a new idea or project. The Design Studies Process Rubric

provides a description of standards for each component of the process at each level. These standards should help you identify the level the student at as you observe their work activity and assess their projects.

Design Studies Drafting for Design and Technical Drawing Rubrics

Two rubrics have been provided for the Drafting for Design and Technical Drawing modules, one for Pictorial Drawings (DESRBC - 2) and one for Multiview Drawings (DESRBC - 3). As with the other rubrics, these identify general standards of performance at each level. You will note that they take into account that some students will be producing their work mechanically while

BASIC COMPETENCIES REFERENCE GUIDE

The following basic competencies (KSA) are integrated throughout the CTS program. A student's performance and growth should be assessed through observations involving the student, the teacher, peers and others. As the student progresses through the levels, he or she builds on competencies gained in earlier levels.

	Basic Competency	Stage 1	Stage 2	Stage 3
P e r s o n a l M a n a g e m e n t	Managing Learning	<i>The student will:</i> <ul style="list-style-type: none"> <input type="checkbox"/> be able to identify/locate appropriate reference/information sources <input type="checkbox"/> identify and demonstrate a variety of learning skills and tools; e.g., learning styles/ preferences and strategies such as notemaking, concept mapping, etc. 	<i>The student will:</i> <ul style="list-style-type: none"> <input type="checkbox"/> apply a variety of learning styles/preferences to enhance ability to acquire new information recall and apply knowledge 	<i>The student will:</i> <ul style="list-style-type: none"> <input type="checkbox"/> draw and defend conclusions from available information <input type="checkbox"/> extract rules or principles <input type="checkbox"/> apply rules and principles to new situations
	Being Innovative	<ul style="list-style-type: none"> <input type="checkbox"/> recognize opportunities and problems <input type="checkbox"/> specify goals and constraints <input type="checkbox"/> generate alternatives <input type="checkbox"/> consider risks <input type="checkbox"/> evaluate and select best alternative 	<ul style="list-style-type: none"> <input type="checkbox"/> think critically and act logically to evaluate situations, solve problems and make decisions 	<ul style="list-style-type: none"> <input type="checkbox"/> combine ideas or information in new ways <input type="checkbox"/> make connections between seemingly unrelated ideas <input type="checkbox"/> prepare, validate and implement plans that reveal new possibilities
	Ethics	<ul style="list-style-type: none"> <input type="checkbox"/> identify appropriate ethical behaviour 	<ul style="list-style-type: none"> <input type="checkbox"/> demonstrate appropriate ethical behaviour 	<ul style="list-style-type: none"> <input type="checkbox"/> encourage and support others to demonstrate ethical behaviour
	Managing Resources	<ul style="list-style-type: none"> <input type="checkbox"/> allocate time effectively by selecting relevant, goal-related activities, ranking them in order of importance, allocating time, and preparing and following schedules. 	<ul style="list-style-type: none"> <input type="checkbox"/> allocate materials and use facilities effectively by acquiring, storing, and distributing materials, supplies, parts, equipment, space, or final products in order to make best use of them. 	<ul style="list-style-type: none"> <input type="checkbox"/> allocate human and other resources effectively by assessing knowledge and skills, distributing work and materials, evaluating performance and providing feedback.
S o c i a l I n t e r a c t i o n s	Communication	<ul style="list-style-type: none"> <input type="checkbox"/> prepare and effectively present accurate, concise written, visual and oral reports 	<ul style="list-style-type: none"> <input type="checkbox"/> communicate thoughts, feelings, and ideas to justify or challenge a position by encouraging, persuading, convincing or otherwise motivating individuals or groups 	<ul style="list-style-type: none"> <input type="checkbox"/> negotiate effectively by working towards an agreement that may involve exchanging specific resources or resolving divergent interests
	Teamwork, Leadership and Service	<ul style="list-style-type: none"> <input type="checkbox"/> participate as an effective member of a team by working cooperatively with others and contributing ideas, suggestions and effort <input type="checkbox"/> recognize and respect peoples' diversity and individual differences 	<ul style="list-style-type: none"> <input type="checkbox"/> serve clients and customers effectively by listening carefully to understand their needs and by providing as much assistance as possible to satisfy their expectations 	<ul style="list-style-type: none"> <input type="checkbox"/> lead when appropriate, mobilizing the group for high performance
	Demonstrating Responsibility (Safety and Accountability)	<ul style="list-style-type: none"> <input type="checkbox"/> demonstrate high standards in attendance and punctuality <input type="checkbox"/> be trustworthy and honest in dealing with others <input type="checkbox"/> follow safe procedures consistently and recognize and eliminate potential hazards. 	<ul style="list-style-type: none"> <input type="checkbox"/> understand and evaluate the impact on self and the organization for breaking with organizational or societal values and regulations. 	<ul style="list-style-type: none"> <input type="checkbox"/> work hard to excel at setting and meeting goals, doing tasks, setting high standards and paying attention to important details.

others will be using Computer Assisted Design and Drafting (CADD) packages. The rubrics do not specify assignments for students to complete. You may wish to develop a marking tool based on these rubrics for use in your program.

Marks and Mark Ranges

You will note that no marks or mark ranges have been assigned on any of the assessment tools. This is because you are in the best position to determine the marks students should receive for the work they produce. If a student meets the standards as stated in the assessment tools, they should receive credit for the module. It may however be that one student's work is "better" than another student's because of its scope, technical quality or aesthetic quality. Or it may be that one student is more proficient than another due to their perseverance, responsibility level or technical skill. You can recognize this through your marks even though both students will have met the standard for the module.

This guide has been developed to help you assess your students' work. It has two sections: Assessment Standards and Specific Assessment Criteria. The Assessment Standards are coded 0 - 4 with descriptions of student performance opposite each code numbers. Using this system, students must meet a minimum standard of 1 to be successful in all introductory level modules, 2 in all intermediate modules and 3 in all advanced level modules. Please consider the major headings under the Specific Assessment Criteria (e.g., Process/Social; Technical Quality) and specify the elements you are assessing under each heading. (Note: These elements may change from project to project.)

Assessment Criteria:

0	Not yet completed task, major deficiencies and/or errors are evident.
1	Completed task as directed, demonstrating rudimentary skills/completeness by following a guided course of action. Quality and productivity met defined outcomes but are inconsistent.
2	Met project/task objectives with limited assistance in planning, solving problems and selecting and using of materials and processes. Only minor errors/deficiencies are noted. Quality and productivity meets defined outcomes, but are inconsistent
3	Met project/task objectives in a self-directed manner, selecting and using tools, materials and processes efficiently and effectively. No minor errors or deficiencies are noted. Defined outcomes regarding quality and partnerships are met consistently.
4	Met project task objectives, in a self-directed manner, selecting and implementing the most appropriate course of action. Tools, processes and materials were selected and used efficiently and confidently. Problems were solved in effective and creative ways. Quality, particularly details and finishes, and productivity exceed standards.

Specific Assessment Criteria:

Process/Social	e.g., design process loop, effort, attitude, work habits, safety, grasp of concepts, teamwork, leadership, ethics
Creativity/Originality/Marketability	e.g., aesthetic quality, practicality, functionality, innovation
Technical Quality	
Planning	e.g., thumbnail drawings, rough drafts, research, follows criteria
Construction	e.g., fabrication, model building, assembly, writing, drawing, pattern, template
Finishing	e.g., mounting, pressing, layout, sanding, etc.
Presentation/Portfolio	e.g., oral presentations, visual presentations, discussion, rationalization of decisions
Comments/Critiques/Reflections	e.g., summary statements about project as a whole from teacher and/or student

Students following a *process of design* will meet these standards in their project work:

	Introductory Level	Intermediate Level	Advanced Level
Process components:			
Identify Need or Problem through Design Brief	<ul style="list-style-type: none"> reads and accurately interprets an introductory level design brief 	<ul style="list-style-type: none"> reads and accurately interprets an intermediate level design brief involving a more complex set of possibilities 	<ul style="list-style-type: none"> accurately identifies design problem or issues and writes a project statement with project objectives and deliverables
Conduct Research	<ul style="list-style-type: none"> conducts research from sources provided or identified by the teacher 	<ul style="list-style-type: none"> identifies pertinent research sources with guidance and conducts research pertaining to the project brief 	<ul style="list-style-type: none"> identifies pertinent research sources in school and community (e.g.: interview with manufacturers, user groups) and conducts research pertaining to the project brief
Generate Ideas	<ul style="list-style-type: none"> generates a number of innovative ideas with teacher guidance which address a simple design problem 	<ul style="list-style-type: none"> generates a number of innovative ideas, with a moderate level of teacher guidance, which address a more complex design problem 	<ul style="list-style-type: none"> generates a number of innovative ideas, with minimal teacher guidance, which address a complex design problem demonstrates challenge of assumptions, conventions and conventional boundaries
Select Most Promising Idea	<ul style="list-style-type: none"> selects most promising idea for resolving the project brief with guidance demonstrates aesthetic awareness through selection 	<ul style="list-style-type: none"> selects most promising idea for resolving the design brief and provides reasons for selection demonstrates increased aesthetic awareness by providing a reasoned rationale for selection 	<ul style="list-style-type: none"> selects most promising idea for resolving the design brief and supports selection with reasoned arguments demonstrates increased aesthetic awareness through reasoned arguments supported by theory and research
Make or Model Design	<ul style="list-style-type: none"> makes project with direct guidance makes appropriate decisions about materials, tools and their applications with direct guidance 	<ul style="list-style-type: none"> makes project with minimal guidance makes appropriate decisions about materials, tools and their applications with minimal guidance 	<ul style="list-style-type: none"> makes project with guidance as requested makes appropriate decisions about materials, tools and their applications with guidance as requested
Present Design to Others	<ul style="list-style-type: none"> presents project to teacher in a portfolio in a neat and appropriate manner 	<ul style="list-style-type: none"> presents project to teacher in a portfolio in a neat and appropriate manner presents work to teacher and peers for critique 	<ul style="list-style-type: none"> presents project to teacher in a portfolio in a neat and appropriate manner presents and discusses work with teacher, peers and others in a critique
Evaluate Design	<ul style="list-style-type: none"> with guidance, evaluates project as to its success in satisfying the project brief and suggests why it was successful or unsuccessful 	<ul style="list-style-type: none"> evaluates project as to its success in satisfying the project brief identifies why it was successful or unsuccessful with guidance, suggests and supports revisions to improve solution 	<ul style="list-style-type: none"> evaluates project as to its success in satisfying the project brief analyses why it was successful or unsuccessful suggests revisions to improve solution

Students engaged in Drafting for Design and / or Technical Drawing modules will meet these standards in their project work:

	Introductory Level	Intermediate Level	Advanced Level
Pictorial Drawings:			
Freehand Pictorial Drawings and Renderings	<ul style="list-style-type: none"> discriminates between different pictorial drawing styles (e.g., isometric, oblique, one- and two-point perspective) produces recognizable pictorial line drawings of specified subjects with guidance uses drawing grids and other freehand drawing tools with guidance 	<ul style="list-style-type: none"> discriminates between different pictorial drawing and rendering techniques and styles describes appropriate applications for different pictorial drawing and rendering techniques and styles renders pictorial line drawings using tone, texture and/ or colour rendering techniques with guidance uses drawing grids and other freehand drawing tools with minimal guidance 	<ul style="list-style-type: none"> selects and uses appropriate pictorial drawing and rendering techniques and styles selects and uses appropriate materials, tools and techniques for different rendering styles renders pictorial line drawings using tone, texture and/ or colour rendering techniques with minimal guidance selects and uses drawing grids and other freehand drawing tools with minimal guidance
Mechanically Produced Pictorial Drawings and Renderings	<ul style="list-style-type: none"> discriminates between different pictorial drawing styles (e.g., isometric, oblique, one- and two-point perspective) produces recognizable pictorial line drawings of specified subjects with guidance uses manual technical drawing tools (e.g., t-square, set-square, parallel rule, drafting machine) with guidance 	<ul style="list-style-type: none"> discriminates between different pictorial drawing and rendering techniques and styles describes appropriate applications for different pictorial drawing and rendering techniques and styles renders pictorial line drawings using tone, texture and/ or colour rendering techniques with guidance uses manual technical drawing tools (e.g. t-square, set-square, parallel rule, drafting machine) with minimal guidance 	<ul style="list-style-type: none"> selects and uses appropriate pictorial drawing and rendering techniques and styles selects and uses appropriate materials, tools and techniques for different pictorial drawing and rendering styles renders pictorial line drawings using tone, texture and/ or colour rendering techniques with minimal guidance selects and uses manual technical drawing tools (e.g., t-square, set-square, parallel rule, drafting machine) with minimal guidance
CADD Produced Pictorial Drawings and Renderings	<ul style="list-style-type: none"> discriminates between different pictorial drawing styles (e.g., isometric, oblique, one- and two-point perspective) produces recognizable pictorial drawings of specified subjects with guidance uses personal computer and CADD (Computer Assisted Design and Drafting) software with specific guidance 	<ul style="list-style-type: none"> discriminates between different pictorial drawing and rendering techniques and styles describes appropriate applications for different pictorial drawing and rendering techniques and styles renders pictorial line drawings using tone, texture and/ or colour rendering techniques with guidance uses personal computer and CADD (Computer Assisted Design and Drafting) software with guidance 	<ul style="list-style-type: none"> selects and uses appropriate pictorial drawing and rendering techniques and styles selects and uses appropriate CADD, tools and techniques for different pictorial drawing and rendering styles renders pictorial line drawings using tone, texture and/ or colour rendering techniques with minimal guidance selects and uses appropriate CADD applications for different rendering techniques and styles

Students engaged in Drafting for Design and/ or Technical Drawing modules will meet these standards in their project work:

	Introductory Level	Intermediate Level	Advanced Level
Multiview Drawings:			
Mechanically Produced Multiview Drawings	<ul style="list-style-type: none"> • produces accurate single view and multiview drawings of simple three-dimensional objects displaying front, top and side view, and title block • accurately dimensions single view and multiview drawings • discriminates between first angle and third angle projections • uses manual technical drawing tools (e.g., t-square, set-square) with guidance 	<ul style="list-style-type: none"> • discriminates between different multiview drawing styles • produces accurate multiview drawings of simple three-dimensional objects displaying front, top and side view, and title block (assembly, section, auxiliary) • produces accurately dimensions and notations for a multiview drawing in accordance with standards and conventions • identifies codes and specifications pertaining to project work • uses manual technical drawing tools (e.g., t-square, set-square, parallel rule, drafting machine) with guidance • describes appropriate applications of different multiview drawing styles 	<ul style="list-style-type: none"> • produces accurate multiview drawings of complex three-dimensional objects displaying front, top and side view, and title block (assembly, section, auxiliary) • produces accurate dimensions and notations for multiview drawings as required in accordance with standards and conventions • identifies and applies codes and specifications project work • uses manual technical drawing tools (e.g. t-square, set-square, parallel rule, drafting machine) with minimal guidance • chooses appropriate drawing styles for projects
CADD Produced Multiview Drawings	<ul style="list-style-type: none"> • produces accurate single view and multiview drawings of simple three-dimensional objects displaying front, top and side view, and title block • accurately dimensions single view and multiview drawings • discriminates between first angle and third angle projections • uses manual technical drawing tools (e.g., t-square, set-square) with guidance 	<ul style="list-style-type: none"> • discriminates between different multiview drawing styles • produces accurate multiview drawings of simple three-dimensional objects displaying front, top and side view, and title block (assembly, section, auxiliary) • produces accurately dimensions and notations for a multiview drawing in accordance with standards and conventions • identifies codes and specifications pertaining to project work • uses a personal computer and CADD (Computer Assisted Design and Drafting) software with guidance 	<ul style="list-style-type: none"> • produces accurate multiview drawings of complex three-dimensional objects displaying front, top and side view, and title block (assembly, section, auxiliary) • produces accurate dimensions and notations for multiview drawings as required in accordance with standards and conventions • identifies and applies codes and specifications project work • uses a personal computer and CADD (Computer Assisted Design and Drafting) software with minimal guidance • chooses appropriate drawing styles for projects

The following is a partial list of the techniques and materials students might use in their design work. Teachers may select techniques and materials relevant to stated module criteria and conditions appropriate to the needs of their students.

Sketching and Drawing					
	() thumbnail	() line	() pencil	Human Form	
	() observational	() gesture	() colour pencil	() body elements	
	() planning	() scribble	() marker	(e.g., head, hand)	
	() detail	() tonal	() pen	() complete human form	
	() other	() hatching	() brush		
		() other	() computer	Natural Forms	
			Materials	() animal forms	
			() drawing paper	() plant forms	
			() cardboard	() geological forms	
			() paint	Manufactured materials	
		() ink	() ceramic	() glass	
		() software	() metal	() paper	
		() other	() plastic	() textiles	
			() wood	() other	
	() thumbnail	() molding or shaping	() knife	Manufactured Forms/ Mechanisms	
	() observational	() adding to or removing	() foam cutter	() personal articles/ clothing	
	() detail	() measuring	() scissors	() machines	
	() other	() cutting	() screwdriver	() structures	
		() joining/fastening	() hammer	() products/ packaging	
		() other	() saw	() other	
			() tools for modelling clay		
			Materials		
			() tape		
			() wire		
		() cloth	() metal		
		() cardboard	() cardboard		
		() modelling clay	() modelling clay		
		() foam	() foam		
		() glue	() glue		
		() plaster	() plaster		
		() plastic	() plastic		
		() other	() other		

INTRODUCTORY	INTERMEDIATE	ADVANCED
<p><i>The student is able to:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • set goals and follow instructions accurately • adhere to established timelines • respond to directed questions and follow necessary steps to find answers • use time effectively <p>Information Gathering and Processing</p> <ul style="list-style-type: none"> • access basic in-school/community information sources • use one or more information-gathering techniques • interpret and organize information in a logical sequence • record information accurately using correct technical terms • distinguish between fact and fiction/opinion/theory • respond to feedback when current approach is not working <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • cooperate with group members • share work appropriately among group members <p>Information Sharing</p> <ul style="list-style-type: none"> • demonstrate effective use of one or more communication media: <i>e.g., written, oral, audio-visual</i> • communicate information in a logical sequence • use correct grammatical convention and technical terms • cite 3 or more basic information sources 	<p><i>The student is able to:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • set goals and establish steps to achieve them • create and adhere to useful timelines • use personal initiative to formulate questions and find answers • plan and use time effectively <p>Information Gathering and Processing</p> <ul style="list-style-type: none"> • access a range of relevant in-school/community resources • use a range of information-gathering techniques • interpret, organize and combine information into a logical sequence • record information accurately with appropriate supporting detail and using correct technical terms • determine accuracy/currency/reliability of information sources • gather and respond to feedback regarding approach to the task <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • cooperate with group members • share work appropriately among group members • negotiate solutions to problems <p>Information Sharing</p> <ul style="list-style-type: none"> • demonstrate effective use of two or more communication media: <i>e.g., written, oral, audio-visual</i> • communicate ideas in a logical sequence with sufficient supporting detail • maintain acceptable grammatical and technical standards • cite 5 or more relevant information sources 	<p><i>The student is able to:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • set clear goals and establish steps to achieve them • create and adhere to detailed timelines • use personal initiative to formulate questions and find answers • plan and use time effectively, prioritizing tasks on a consistent basis <p>Information Gathering and Processing</p> <ul style="list-style-type: none"> • access a range of relevant information sources and recognize when additional information is required • demonstrate resourcefulness in collecting data • interpret, organize and combine information in creative and thoughtful ways • record information accurately with appropriate supporting detail and using correct technical terms • recognize underlying bias/assumptions/values in information sources • assess and refine approach to the task and project status based on feedback and reflection <p>Collaboration and Teamwork</p> <ul style="list-style-type: none"> • cooperate with group members • share work appropriately among group members • negotiate with sensitivity solutions to problems • display effective communication and leadership skills <p>Information Sharing</p> <ul style="list-style-type: none"> • demonstrate effective use of a variety of communication media: <i>e.g., written, oral, audio-visual</i> • communicate thoughts/feelings/ideas clearly to justify or challenge a position • maintain acceptable grammatical and technical standards • give evidence of adequate information gathering by citing 7 or more relevant information sources

INTRODUCTORY	INTERMEDIATE	ADVANCED
<p><i>The student is able to:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • set goals and follow instructions accurately • respond to directed questions and follow necessary steps to find answers • access basic in-school/community information sources • interpret and organize information into a logical sequence • record information accurately using correct technical terms • use time effectively <p>Presentation</p> <ul style="list-style-type: none"> • demonstrate effective use of at least one medium of communication: <i>e.g., Written: spelling, punctuation, grammar, basic format</i> <p><i>Oral: voice projection, body language</i></p> <p><i>Audio-Visual: techniques, tools</i></p> <ul style="list-style-type: none"> • use correct grammatical convention and technical terms through proof-reading/editing • provide an introduction that describes the purpose of the project • communicate information in a logical sequence • state a conclusion based on a summary of facts • provide a reference list of 3 or more basic information sources 	<p><i>The student is able to:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • set goals and describe steps to achieve them • use personal initiative to formulate questions and find answers • access a range of relevant in-school/community resources • interpret, organize and combine information into a logical sequence • record information accurately with appropriate supporting detail and using correct technical terms • plan and use time effectively • gather and respond to feedback regarding approach to task and project status <p>Presentation</p> <ul style="list-style-type: none"> • demonstrate effective use of at least two communication media: <i>e.g., Written: spelling, punctuation, grammar, format (formal/informal)</i> <p><i>Oral: voice projection, body language, appearance</i></p> <p><i>Audio-Visual: techniques, tools, clarity</i></p> <ul style="list-style-type: none"> • maintain acceptable grammatical and technical standards through proof-reading and editing • provide an introduction that describes the purpose and scope of the project • communicate ideas into a logical sequence with sufficient supporting detail • state a conclusion by synthesizing the information gathered • provide a reference list that includes 5 or more relevant information sources 	<p><i>The student is able to:</i></p> <p>Preparation and Planning</p> <ul style="list-style-type: none"> • set goals and describe steps to achieve them • use personal initiative to formulate questions and find answers • access a range of relevant information sources and recognize when additional information is required • interpret, organize and combine information in creative and thoughtful ways • record information accurately using appropriate technical terms and supporting detail • plan and use time effectively, prioritizing tasks on a consistent basis • assess and refine approach to task and project status based on feedback and reflection <p>Presentation</p> <ul style="list-style-type: none"> • demonstrate effective use of a variety of communication media: <i>e.g., Written: spelling, punctuation, grammar, format (formal/informal, technical/literary)</i> <p><i>Oral: voice projection, body language, appearance, enthusiasm, evidence of prior practice</i></p> <p><i>Audio-Visual: techniques, tools, clarity, speed and pacing</i></p> <ul style="list-style-type: none"> • maintain acceptable grammatical and technical standards through proof-reading and editing • provide an introduction that describes the purpose and scope of the project • communicate thoughts/feelings/ideas clearly to justify or challenge a position • state a conclusion by analyzing and synthesizing the information gathered • give evidence of adequate research through a reference list including 7 or more relevant information sources

LINKAGES/TRANSITIONS

There are many linkages between Design Studies and other CTS strands, and between Design Studies and other secondary programs. The diverse nature of the Design Studies strand also extends and reinforces linkages to a variety of post-secondary studies and career areas.

WITH OTHER CTS STRANDS

The notion of design can be found in the many CTS strands. Examples include:

- Fashion Studies—pattern design, fashion illustration
- Communication Technology—graphic design, photographic design, layout and design, reproduction technologies, presentation and communication
- Construction Technologies—structural design, architectural design, furniture design, materials and production processes, mass-production, pre-fabrication
- Fabrication Studies—part and component design, Computer Aided Manufacturing (CAM)
- Management and Marketing—display design, advertising design
- Enterprise and Innovation—product conception, product promotion.

WITH OTHER SECONDARY PROGRAMS

Design can also be found in other complementary programs including:

- Art—elements and principles of design, visual design, three-dimensional design
- Drama—set design, costume design, lighting design.

Design also links primarily with the elementary and junior high Science programs. Elementary Science is addressing Design and Technology including problem solving (the scientific method being closely related to a process of design). Specific themes include Materials, Movement, Structures and Control.

Junior high Science has within it three major areas of emphasis: Nature of Science, Science

and Technology; Science, Technology and Society. The program modality is based on using the inquiry method, which strongly parallels design methodology. Scientific inquiry skills are identified in the Nature of Science. They are reinforced by Technological Problem-Solving Skills (a process of design) identified within Science and Technology and presented as:

- understanding the problem
 - identify the purpose
 - identify specific requirements (specifications)
- developing a plan
 - identifying alternatives
 - planning and designing
- carrying out the plan
 - testing the design
 - troubleshooting
- evaluating
 - evaluating the design
 - evaluating the planning process.

Furthermore, the Science and Technology component identifies seven additional goals including having students:

- appreciate “good design, taking into consideration function, safety, aesthetics and environmental effects”
- be willing to “take the initiative in dealing with practical problems”
- be aware of “alternatives in the approach to technological problems”
- appreciate the “need for technological devices and processes to serve human needs”.

Many of the societal aspects of “design” are supported by the Science, Technology and Society component with respect to attitude, e.g., “appreciation of the need for informed decision making at both personal and societal levels” and through the decision-making skills identified. Identifying issues and alternatives, researching, reflecting and deciding, taking action and evaluating are again components of the process of design.

The Grade 7 science program includes units on Structure and Design, and Force and Motion, both of which relate directly to the Three-Dimensional and Living Environments modules

in Design Studies. Similarly, Grade 8 science includes Energy and Machines, Consumer Product Testing and Interactions and Environments, and Grade 9 includes Fluids and Pressure, Heat Energy: Transfer and Conservation, and Electromagnetic Systems. These again support the Three-Dimensional Design and Living Environments foci in Design Studies.

TO OTHER GOVERNMENT INITIATIVES

In 1991, the federal Department of Communications initiative on design in Canada drew together representatives from the design community to look at the state of design in Canada and to discuss its future. Representations were made by leading designers at that time. The Design Studies program has received input from contributors to this process and has therefore in part been shaped by the initiative.

TO THE WORKPLACE

There is limited direct entry into the workplace from Design Studies as the development of marketable skills in design requires post-secondary training. As one business-based member of the communication network commented, the Design Studies "course is very ambitious—covers ALL design, i.e., architectural, graphic, industrial, interior, set, etc. . . .? Any one of these is enough for a four year program." Two Design Studies modules, The Business and Profession of Design and Portfolio Presentation, deal specifically with helping students prepare for and successfully enter post-secondary design schools.

TO RELATED POST-SECONDARY PROGRAMS

There is articulation between Design Studies and programs offered at the post-secondary level. Students wishing to pursue a design career will in most instances seek additional training in one of the following careers:

- Architect
- Draftsman
- Engineer
- Exhibition/Display Designer

- Fashion Designer
- Furniture Designer
- Graphic Designer
- Illustrator
- Industrial (Product) Designer
- Interior Designer
- Landscape Designer
- Set Designer

Opportunities for post-secondary learning in Alberta include:

- Bachelor of Design program being offered at the University of Alberta (September 1994), Edmonton. This program instructs students in visual and industrial design and is linked with the faculties of Engineering, Computing Science and Business Management.
- Master of Environmental Design, University of Calgary. Students can specialize in industrial (product) design, architectural design, urban planning or environmental design.
- Bachelor of Engineering programs at the University of Alberta, University of Calgary and University of Lethbridge (one-year transfer program).
- Bachelor of Fine Arts in Costume Design, University of Alberta.
- Fashion Design, University of Lethbridge, one-year transfer program).
- Diploma in Fashion Design, Olds College.
- Diploma in Interior Design, Mount Royal College, Calgary.
- Diploma in Visual Design, Alberta College of Art, Edmonton.
- Diploma in Visual Design, Grant MacEwan College, Edmonton.
- Diplomas in Engineering Design and Technology and Architectural Design, Northern Alberta Institute of Technology (NAIT) and Southern Alberta Institute of Technology (SAIT), Edmonton and Calgary.

CAREER & TECHNOLOGY STUDIES

DESIGN STUDIES

LEARNING RESOURCE GUIDE

INTERIM 1994
(SEPTEMBER 1994 - SEPTEMBER 1997)

MAY 1995

Alberta
EDUCATION
CURRICULUM STANDARDS BRANCH

Comments and suggestions are welcome and should be directed to:

Career and Technology Studies Unit
Alberta Education
Curriculum Standards Branch
11160 Jasper Avenue
Edmonton, AB
T5K 0L2
Telephone: 422-4872
Fax: 422-5129

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INTRODUCTION

CTS AND THE RESOURCE-BASED CLASSROOM

Career and Technology Studies (CTS) encourages teachers to establish a resource-based classroom, where a variety of appropriate, up-to-date print and non-print resources are available. Learning resources identified for CTS strands include print, software, interactive videos, manipulatives, student learning guides and tutorials.

The resource-based classroom approach accommodates a variety of instructional strategies and teaching styles, and supports individual or small group planning. It provides students with opportunities to interact with a wide range of information sources in a variety of learning situations. Students in CTS are encouraged to take an active role in managing their own learning. Ready access to a strong resource base enables students to learn to screen and use information appropriately, to solve problems, to meet specific classroom and learning needs, and to develop competency in reading, writing, speaking, listening and viewing.

PURPOSE AND ORGANIZATION OF THIS DOCUMENT

The purpose of this document is to help teachers identify a variety of resources to meet their needs and those of the students taking the new Design Studies curriculum. It is hoped that this practical guide to resources will help teachers develop a useful, accessible resource centre that will encourage students to become independent, creative thinkers.

This document is organized as follows:

- Authorized Resources:
 - basic learning resources
 - support learning resources
 - teaching resources
- Other Resources
- Additional Sources.

Some resources in the guide have been authorized for use in some or all of the CTS strands, e.g., the 11-video Career and Technology Studies series produced by ACCESS Network. Full information is provided in the appropriate section of this resource guide.

Each resource in the guide provides bibliographic information, an annotation where appropriate, and a correlation to the Design Studies modules. The distributor code for each entry will facilitate ordering resources. It is recommended that teachers preview all resources before purchasing, or purchase one copy for their reference and additional copies as required.

Distributor Code	Resources		Levels/Mod. No.			1 = Introductory 2 = Intermediate 3 = Advanced Indicates module number
			1	2	3	
ATEC	Author	Title	101	201	301	
	Bibliographic Information					
	Annotation					

Distributor Code - see Distributor Directory

HOW TO ORDER

Most authorized resources are available from the Learning Resources Distributing Centre (LRDC) at:

12360 - 142 Street
Edmonton, AB
T5L 4X9
Telephone: 427-2767
Fax: 422-9750

Purchase order numbers have been provided (where possible) for resources available through the LRDC. The section on Additional Sources lists a variety of other places to find information related to this strand. In addition, at the back of this document is a Distributor Directory, which contains the name and address of each publisher/distributor referred to in the resource list. Note that in some cases a resource may be published by one company but distributed through another.

The information contained is as complete and accurate as possible.

RESOURCE POLICY

For further information on resource policy and definitions, refer to the *Student Learning Resources Policy* and *Teaching Resources Policy* or contact:

Learning Resources Unit
Curriculum Standards Branch
Alberta Education
5th Floor, Devonian Building, East Tower
11160 Jasper Avenue
Edmonton, AB
T5K 0L2
Telephone: 422-4872
Fax: 422-5129

AUTHORIZED RESOURCES

BASIC LEARNING RESOURCES

The following basic learning resources have been authorized by Alberta Education for use in the Design Studies curriculum. A curriculum correlation appears in the right-hand column. Note: CADD software is being sought for the Macintosh platform.

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	<p><i>Architecture: Drafting and Design.</i> (6th edition.) Donald E. Hepler, Paul R. Wallach and Dana J. Hepler. New York, NY: Glencoe/McGraw-Hill, 1991. Student Text. LRDC PO#285298-01.</p> <p>This comprehensive drafting text provides a wealth of information for the person engaged in drafting. Teacher's Manual and Workbook are available. (Note: Uses primarily imperial measurement.)</p>	101	204	307
		103	205	308
		105		311
		106		312
				313
				314
				315
				316
				317
				318
LRDC	<p><i>Architecture: Residential Drawing and Design.</i> Clois E. Kicklighter, Ronald J. Baird and Joan C. Kicklighter. South Holland, IL: Goodheart-Willcox Co. Inc., 1990. Student Text. LRDC PO#275372-01.</p> <p>Excellent introductory resource for architectural design and drafting. It covers types of designs, floor plans and planning, electrical, plumbing, heating, landscaping and building codes and specifications. Teacher Resource Guide and Answer Key are available. (Note: Uses primarily imperial measurement.)</p>	105	203	307
		106	204	308
			205	309
			206	310
				311
				312
				313
				315
				316
				318
LRDC	<p><i>Ashlar Vellum 3D.</i> (Macintosh Version 2.5.) Sunnyvale, CA: Ashlar Inc., 1993.</p>	105	203	310
		106	204	311
			205	312
				313
				314
				315
				316
LRCD	<p><i>AUTOCAD for Macintosh.</i> (Release R12.) Autodesk Inc./Merlan Scientific Ltd.</p>		203	310
			204	311
			205	312
				313
				314
				315
				316

Basic Learning Resources (Cont'd.)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	<i>Autosketch Version 3.0.</i> Addison-Wesley, 1991. Student Version IBM 5 1/4" (LRDC PO#158297-99) and Student Version IBM 3 1/2" (LRDC PO#231027-99).	105	203	311
		106	204	312
			205	313
				314
				315
				316
LRDC	<i>Collins CDT: Design and Communication.</i> K. Crampton, M. Finney and A. Breckon (editors). Hammersmith, London: Collins Educational, 1988. LRDC PO#276750-01. This British resource covers all areas of graphic communication and provides excellent basic information in the more technical, drawing and design areas. Chapters include skills in drawing, engineering drawing and environmental drawing.	101	201	301
		102	203	302
		103	204	303
		104	205	304
		105		305
		106		306
				310
				311
				312
				313
				314
				315
				316
LRDC	<i>Collins CDT: Design and Realisation.</i> C. Chapman, M. Peace and A. Breckon (editors). Hammersmith, London: Collins Educational, 1988. LRDC PO#276742-01. This British resource concentrates on three-dimensional design, offering skills and techniques, materials, basic technology (e.g., control systems, structures) manufacturing technologies and product design.	101	201	304
		102	202	305
		103	204	306
		104	205	319
			206	
LRDC	<i>Design Graphics: Drawing and Presenting Your Design Ideas.</i> David Fair and Marilyn Kenny. London: Hodder and Stoughton, 1987. LRDC PO#276700-01. This resource covers most of the basics for a beginning designer. It is an easily accessible resource providing instruction, and examples of design techniques and methods with particular emphasis on drawing, illustration and rendering.	101	201	301
		102	202	302
		103	204	304
		104		305
		106		311
				312
LRDC	<i>Exploring Drafting: Fundamentals of Technology.</i> John R. Walker. South Holland, IL: Goodheart-Willcox Co. Inc., 1991. Student Text LRDC PO#275398-01. This is a comprehensive resource for students learning basic drafting. It covers techniques, terminology and application, and includes clear, concise descriptions with supporting illustrations. Solution manual and worksheets are available.	101	201	310
		103	203	311
		105	204	312
		106	205	313
				314
				315
				316

Basic Learning Resources (Cont'd.)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	<i>Interior Design Illustrated.</i> Francis D.K. Ching. New York, NY: Van Nostrand Reinhold, 1987. LRDC PO#275231-01. The purpose of this primer is to introduce to students of interior design those fundamental elements which make up our interior environments. It outlines the characteristics of each element and presents the choices we have in selecting and arranging them into design patterns. In making these choices, emphasis is placed on basic design principles and how design relationships determine the functional, structural and aesthetic qualities of interior spaces.	101	201	304
		102	202	305
		103	204	306
		104		307
		106		308
				309
LRDC	<i>Microstation PC Version 4.0.</i> Intergraph Canada, 1991. IBM. LRDC PO#224494-99.			311
			203	312
			204	313
			205	314
				315
				316

SUPPORT LEARNING RESOURCES

The following support learning resources are authorized by Alberta Education to assist in addressing some of the learner expectations of a module or components of modules.

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	<p><i>Architecture: Drafting and Design.</i> (6th edition.) Donald E. Hepler, Paul R. Wallach and Dana J. Hepler. New York, NY: Glencoe/McGraw-Hill, 1991. Workbook. LRDC PO#285280-01.</p> <p>See Basic Learning Resources for annotation and correlation.</p>			
LRDC	<p><i>Architecture: Residential Drawing and Design.</i> Clois E. Kicklighter, Ronald J. Baird and Joan C. Kicklighter. South Holland, IL: Goodheart-Willcox Co. Inc., 1990. Workbook. LRDC PO#275364-01.</p> <p>See Basic Learning Resources for annotation and correlation.</p>			
ACC	<p><i>Career and Technology Studies: Key Concepts.</i> Edmonton, AB: ACCESS Network.</p> <p>Series of videos and utilization guides relevant to all CTS strands. Series consists of <i>Anatomy of a Plan, Creativity, Electronic Communication, The Ethics Jungle, Go Figure, Innovation, Making Ethical Decisions, Portfolios, Project Planning, Responsibility and Technical Writing.</i></p>	all	all	all
LRDC	<p><i>Communicating Design (Design and Technology in Action series).</i> Tom Baird. Oxford: Heinemann Educational, 1990. LRDC PO#275512-01.</p> <p>This British resource emphasizes communication through basic drawing techniques, and specifics to do with the use of colour, graphics, modelling and geometric constructions as they are applied in design.</p>	101 102 103 104	201	301 302 303 313
LRDC	<p><i>Design and Drawing: An Applied Approach.</i> Richard L. Shadrin. Worcester: Davis Publications, Inc., 1992. LRDC PO#275504-01.</p> <p>This is a good introductory resource providing basic information on a wide variety of design areas. Biographies of famous designers highlighting their life and work are presented.</p>	101 102 103 104	201 202 204 206	317 319
LRDC	<p><i>Design and Technology.</i> Colin Caborn, Ian Mould and John Cave. Walton Thames: Thomas Nelson and Sons, 1989. LRDC PO#143131-04.</p> <p>Provides teachers and students with a wealth of information and techniques to do with materials, tools, processes, mechanisms and control devices, electronics, structures, energy and communication. These are covered in some depth.</p>	101 102 103 104 106	201 202	304 305 306 311 312 313

Support Learning Resources (Cont'd.)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	<p><i>Design Dialogue.</i> Jack Stoops and Jerry Samuelson. Worchester: Davis Publications, Inc., 1990. LRDC PO#275497-01.</p> <p>Focuses on functional design as aesthetic solutions to visual problems in daily life. Text discusses the role of perception and imagination in the design process. A section is included on major designers and design movements. The design projects given are referenced to and follow the sequencing of the text.</p>	101	201	301
		102	202	302
		103	206	303
		104		
LRDC	<p><i>Designing Interiors.</i> Rosemary Kilmer and Otie W. Kilmer. Orlando, FL: Harcourt, Brace, Jovanovich, 1992. LRDC PO#275306-13.</p> <p>A comprehensive overview of the knowledge required by the interior designer. Presents interior design as an integrated process applicable to residential and commercial interiors. The text follows the design process from problem awareness to incorporating various materials and building systems to create interior spaces.</p>	102	202	304
			204	305
			206	306
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				308
				309
				311
				312
LRDC	<p><i>Exploring Drafting: Fundamentals of Technology.</i> John R. Walker. South Holland, IL: Goodheart-Willcox Co. Inc., 1991. Worksheets. LRDC PO#275380-01.</p> <p>See Basic Learning Resources for annotation and correlation.</p>			313
				318
LRDC	<p><i>Foundations of Graphic Design.</i> Kevin Gatta, Gusty Lange and Marilyn Lyons. Worchester: Davis Publications, Inc., 1991. LRDC PO#275489-01.</p> <p>A comprehensive student resource for the graphic design area, this text covers tools, materials and techniques from concept to press. It also has many good design examples and biographies of well-known designers.</p>	101	201	301
		102	202	302
		103	206	303
				318
VEC	<p><i>Future Habitats</i> (Futures 2 series). Foundation for the Advancement of Science and Education (PBS). Distributed by Visual Education Centre (VEC), 1992.</p> <p><i>Future Habitats</i> is a 15-minute program that demonstrates the relationship between mathematics and the design of structures for human habitation. Emphasis is placed on space habitation and some of the considerations scientists/designers/engineers must deal with. Jaime Escalante hosts with Leonard Nemoy as special guest.</p>		202	307
			203	308
			204	309
				310
				311
				312
				313
				317
				318

Support Learning Resources (Cont'd.)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
VEC	<p><i>Graphic Design</i> (Futures 2 series). Foundation for the Advancement of Science and Education (PBS). Distributed by Visual Education Centre (VEC), 1992.</p> <p><i>Graphic Design</i> is a 15-minute program that shows students how the graphic design profession offers them practical applications of mathematics in advertising, entertainment and communication. Introduces students to seven distinct graphic fields. Examples are drawn from USA Today, MTV and other workplaces where students observe this fast-paced career in action. Jaime Escalante and graphic designer Roland Young demonstrate the role of symmetry in creating a design.</p>	101	201	301
		102	202	302
		103	203	303
		104		305
				307
				308
				309
				310
				312
				317
VEC	<p><i>Industrial Design</i> (Futures 2 series). Foundation for the Advancement of Science and Education (PBS). Distributed by Visual Education Centre (VEC), 1992.</p> <p><i>Industrial Design</i> is a 15-minute program that demonstrates how mathematics is used by industrial designers as they develop new products for consumers. Jaime Escalante hosts the program and Syd Mead, industrial designer, is his guest.</p>	101	202	304
		102		305
		103		306
		104		307
				308
				309
				310
				317
				318

TEACHING RESOURCES

The following teaching resources are authorized by Alberta Education to assist teachers in the instructional process.

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	<p><i>Architecture: Drafting and Design.</i> (6th edition.) Donald E. Hepler, Paul R. Wallach and Dana J. Hepler. New York, NY: Glencoe/McGraw-Hill, 1991. Teacher's Manual. LRDC PO#275752-01.</p> <p>Teacher's Manual to accompany student text and workbook. See Basic Learning Resources for annotation and module correlation.</p>			
LRDC	<p><i>Architecture: Residential Drawing and Design.</i> Clois E. Kicklighter, Ronald J. Baird and Joan C. Kicklighter. South Holland, IL: Goodheart-Willcox Co. Inc., 1990. Teacher's Resource Guide (LRDC PO#275348-01) and Answer Key (LRDC PO#275314-01).</p> <p>Teacher's Resource Guide and answer key to accompany student text. See Basic Learning Resources for annotation and module correlation.</p>			
LRDC	<p><i>Basic Visual Concepts and Principles for Artists, Architects, and Designers.</i> Charles Wallschlaeger and Cynthia Busic-Snyder. Dubuque, IA: Wm. C. Brown Publishers, 1992.</p> <p>Centres on a process-oriented approach to learning the theories, concepts and skills used in creating form. The notion of process is emphasized as it is applied in many design fields. The theoretical constructs are supported by practical problems with sample solutions, appropriate definitions and a substantial bibliography specific to each topic covered.</p>			
LRDC	<p><i>Design and Technology.</i> Colin Caborn, Ian Mould and John Cave. Walton Thames: Thomas Nelson and Sons, 1989. LRDC PO#143131-16.</p> <p>See Support Learning Resources for annotation and module correlation.</p>			
LRDC	<p><i>Designing Interiors.</i> Rosemary Kilmer and Otie W. Kilmer. Orlando, FL: Harcourt, Brace, Jovanovich, 1992. LRDC PO#275306-01.</p> <p>See Support Learning Resources for annotation and module correlation.</p>			
LRDC	<p><i>Exploring Drafting: Fundamentals of Technology.</i> John, R. Walker. South Holland, IL: The Goodheart-Willcox Company, Inc., 1991. Solution Manual to accompany student text and worksheets. LRDC PO#275356-01.</p> <p>See Basic Learning Resources for annotation and module correlation.</p>			

Teaching Resources (Cont'd.)

Distributor Code	Resources	Levels/Module No.		
		1	2	3
LRDC	<p><i>Graphic Design Basics.</i> (2nd edition.) Amy E. Arntson. Fort Worth, TX: Harcourt, Brace, Jovanovich College Publishers, 1993. LRDC PO#275299-01.</p> <p>This excellent teaching resource provides a solid design philosophy and some good ideas for student work. It covers all aspects of graphic design very well. This is a well-designed, attractive resource written at a introductory college or university level.</p>	101	201	301
		102	204	302
		103	206	311
		104		312
		106		
LRDC	<p><i>Rapid Viz: A New Method for the Rapid Visualization of Ideas.</i> Kurt Hanks and Larry Belliston. Menlo Park, CA: Crisp Publications, 1990.</p> <p><i>Rapid Viz</i> is a drawing book for designers who want to get their ideas down quickly and effectively, and need the skills to do so. The book is full of ideas and examples and includes a wide variety of subject matter. Teachers will find this a useful tool in their drawing/design class.</p>			

DESIGN STUDIES RESOURCES

THEME CODE:	FORMAT CODE:	STATUS CODE:	LEVEL CODE:	JUNIOR/SENIOR HIGH CODE:
A. Design Skills, Processes and Applications	<i>p</i> - Print	<i>B</i> - Basic	1 - Introductory	1 - Junior High
B. Drafting for Design and Technical Drawing Skills	<i>v</i> - Video	<i>S</i> - Support	2 - Intermediate	3 - Senior High
C. Business/Issues/History	<i>s</i> - Software	<i>T</i> - Teaching	3 - Advanced	

[illegible]

DESIGN STUDIES RESOURCES

[illegible]

OTHER RESOURCES

These titles are provided as a service only to assist local jurisdictions to identify resources that contain potentially useful ideas for teachers. Alberta Education has done a Tolerance and Understanding Audit and a preliminary review of the resources. However, the responsibility to evaluate these resources prior to selection rests with the user, in accordance with any existing local policy.

Distributor Code	Other Resources
ITF	<p><i>Discovering the Future: The Business of Paradigms.</i> (2nd edition.) Joel Barker. Toronto, ON: Kinetic, Videotape with discussion guide, 1990.</p> <p>"Paradigms" are rules we take for granted - are most basic assumptions about how we live and work. In this new expanded second edition, Joel Barker's "Going Back to Zero" rule reveals how industry giants and newcomers to a field start as equals when paradigms shift.</p>
NEL	<p><i>Technical Drawing.</i> (3rd edition.) David L. Goetsch, John A. Nelson and William S. Chalk. New York, NY: Delmar Publishing Inc., 1994.</p> <p>This comprehensive resource covers all aspects of the technical drafting field. It is a high level reference source most appropriate for teacher reference.</p>

ADDITIONAL SOURCES

Available to Design Studies teachers, both locally and provincially, are many sources of information that can be used to enhance Career and Technology Studies. These sources are available through the community (e.g., libraries, boards, committees, clubs, associations) and through government agencies, resource centres and organizations. Some of these sources, e.g., government departments, undergo frequent name and/or telephone number changes. Please consult your telephone directory or an appropriate government directory.

The following is a partial list of sources in the community to consider:

TEACHER-LIBRARIANS

Planned and purposeful use of library resources helps students grow in their ability to gather, process and share information. Research activities require access to an adequate quantity and variety of appropriate, up-to-date print and non-print resources from the school library, other libraries, the community and additional sources. Some techniques to consider are:

- planning together
- establishing specific objectives
- integrating research skills into planning.

Cooperation between the teacher-librarian and the subject area teacher in the development of effectively planned resource-based research activities ensures that students are taught the research skills as well as the subject content.

Also see *Focus on Research: A Guide to Developing Student's Research Skills* referenced in the Alberta Education Resources section.

ALBERTA EDUCATION SOURCES

Alberta Government telephone numbers can be reached free of charge by calling the RITE number switchboard in your area.

The following monographs are available for purchase from:

Learning Resources Distributing Centre
12360 - 142 Street
Edmonton, AB
T5L 4X9
Telephone: 427-2767
Fax: 422-9750

Please consult the "Support Documents" section or the "Legal, Service and Information Publications" section in the *Buyers Guide* for ordering information and costs.

Developmental Framework Documents

- *The Emerging Student: Relationships Among the Cognitive, Social and Physical Domains of Development*, 1991

This document looks at the whole child, or student, as a productive learner, integrating all the domains of development: cognitive, social and physical. It emphasizes the need for providing balanced curriculum and instruction.

- *Students' Interactions Developmental Framework: The Social Sphere*, 1988

This document focuses on the student as a social being. It looks at the student's affective or emotional growth and examines moral development. These three domains make up the social sphere.

- *Students' Physical Growth: Developmental Framework Physical Dimension*, 1988

This document examines children's normal physical growth in three areas: perceptual, structural and motor development. In none of these areas is the child's growth in a single continuous curve throughout the first two decades of life. Physical growth is characterized by periods of rapid growth and periods of slower growth. Consequently, differences and changes in growth patterns may affect the timing of certain learning processes.

- *Students' Thinking: Developmental Framework Cognitive Domain*, 1987

This document explores children's cognitive development from infancy to adolescence. The Piagetian stages of pre-operational, concrete operational and formal operational thinking are explained. Suggestions for improving the learning process are also presented.

Others

- *Focus on Research: A Guide to Developing Students' Research Skills*, 1990

This document outlines a resource-based research model that helps students manage information efficiently and effectively, and in this process, to gain skills that are transferable to all school and work situations. This model provides a developmental approach to teaching students how to do research.

- *Teaching Thinking: Enhancing Learning*, 1990

Principles and guidelines for cultivating thinking, ECS to Grade 12, have been developed in this resource. It offers a definition of thinking, describes nine basic principles on which the suggested practices are based, and discusses possible procedures for implementation in schools and classrooms.

OTHER GOVERNMENT SOURCES

ACCESS Network

ACCESS Network offers a variety of resources and services to teachers. For a nominal dubbing and tape fee, teachers may have ACCESS Network audio and video library tapes copied. ACCESS Network publishes listings of audio and video cassettes as well as a comprehensive programming schedule.

Of particular interest are the Career and Technology Studies videos, which are available with utilization guides. The guides outline key points in each video and suggest questions for discussion, classroom projects and other activities. Video topics are listed in the Support Learning Resources section of this Guide. Videos and accompanying support material can be obtained from:

ACCESS Network

3720 - 76 Avenue
Edmonton, AB
T5B 2N6
Telephone: (403) 440-7777 (in Edmonton)
1-(800) 352-8293
(outside Edmonton)

Alberta Apprenticeship Program

For more information, contact the Alberta Advanced Education and Career Development office nearest you or call the Alberta Career Information Hotline. 1-800-661-3753 (toll-free) Edmonton: 422-4266

Alberta Labour

9940 - 106 Street
Edmonton, AB
T5K 2N2
Telephone: 427-8848

Offices are also in Calgary, Camrose, Edson, Fort McMurray, Grande Prairie, Lethbridge, Medicine Hat, Red Deer and Vermilion.

National Film Board of Canada (NFB)

The NFB has numerous films and videotapes that may be suitable for Design Studies. For a list of NFB films and videotapes indexed by title, subject and director, or for rental or purchase of NFB films and videotapes, call 1-800-267-7710 (toll-free).

Educational Marketing Officers in Calgary and Edmonton are available, province wide, for workshops, conferences, professional development days and similar activities. For northern Alberta and the Northwest Territories, the Educational Marketing Officer can be reached at 495-3012 (fax, 495-6412). For southern Alberta, contact the Educational Marketing Officer at 292-5411 (fax, 292-5458).

ACCESS Network and some school boards have acquired duplication rights to some NFB videotapes. Please consult the relevant catalogues in your school or school district.

The Calgary Public Library has a selection of NFB films and videotapes that can be borrowed free of charge with a Calgary Public Library borrower's card. For further information, contact:

Calgary Public Library
Films and Recordings Department
616 Macleod Trail SE
Calgary, AB
T2G 2M2
Telephone: 260-2650
Fax: 292-5458

Resource Centres

Urban Resource Centres

Calgary Board of Education
Supervisor, Education Media
3610 - 9 Street SE
Calgary, AB
Telephone: 294-8540
Fax: 287-9739

Calgary Separate School Board
Supervisor, Instructional Materials
1000 - 5 Avenue SW
Calgary, AB
T2P 0N7
Telephone: 246-6663
Fax: 249-3054

County of Strathcona
Director, Learning Resource Service
2001 Sherwood Drive
Sherwood Park, AB
T8A 3W7

Edmonton Public School Board
Learning Resource Consultant
Centre for Education
One Kingsway Avenue
Edmonton, AB
T5H 4G9
Telephone: 429-8320
Fax: 429-8313

Lakeland School District No. 5460
Area Superintendent
Postal Bag 1001
6005 - 50 Avenue
Bonnyville, AB
T9N 2L4
Telephone: 826-3145
Fax: 826-4600

Medicine Hat School District No. 75
IMC Manager
601 1 Avenue SW
Medicine Hat, AB
T1A 4Y7
Telephone: 526-1323
Fax: 529-5339

Red Deer Public School Board
Coordinator of Instruction
4747 - 53 Street
Red Deer, AB
T4N 2E6
Telephone: 343-1405
Fax: 347-8190

St. Anthony's Teacher Centre
Supervisor, Curricular Resources
10425 - 84 Avenue
Edmonton, AB
T6E 2H3
Telephone: 439-7356
Fax: 433-0181

Regional Resource Centres

Zone 1

Zone 1 Regional Resource Centre
Film Supervisor
10020 - 101 Street
P.O. Box 6536
Peace River, AB
T8S 1S3
Telephone: 624-3187
Fax: 624-5941

Zones II and III

Central Alberta Media Services (CAMS)
Film Supervisor
182 Sioux Road
Sherwood Park, AB
T8A 3K5
Telephone: 464-5540
Fax: 467-5469

Zone IV

Alberta Central Regional Education Services
(ACRES)

Operations Manager

County of Lacombe

Parkland Regional Library Building

56 Avenue and 53 Street Corner

Box 3220

Lacombe, AB

T0C 1S0

Telephone: 782-5730

Fax: 782-5831

Zone V

South Central Alberta Resource Centre (SCARC)

c/o County of Wheatland

435 B Hwy #1

Strathmore, AB

T1P 1J4

Telephone: 934-5028

Fax: 934-4889

Zone VI

Southern Alberta Learning Resource Centre
(SALRC)

Film Supervisor

Provincial Government Administration Building

120, 909 - 3 Avenue N

Box 845

Lethbridge, AB

T1J 3Z8

Telephone: 320-7807

Fax: 320-7817

Energy Conservation and Renewable Energy

Western Regional Office

200 - Grandin Park Plaza

22 Winston Churchill Avenue

Street Albert, AB

T8N 1B4

Regional Communications

355, 200 - 4 Avenue SE

Calgary, AB

T2G 4X3

Fisheries and Oceans Canada

31 - 46 Street

Edmonton, AB

T6B 3B2

Telephone: 495-7023

Fax: 495-7022

Or

102, 2938 - 11 Street NE

Calgary, AB

T2E 7L7

Telephone: 292-5858

Fax: 292-6088

Health Canada

Publications

Public Affairs, Head Office

Brooke Claxton Building

de la Colombine

Tunney's Pasture

Ottawa, ON

K1A 0K9

Health Protection Branch

840, 9700 Jasper Avenue

Edmonton, AB

T5J 4C3

Telephone: 495-2626

Fax: 495-2624

Or

282, 220 - 4th Avenue SE

Calgary, AB

T2G 4X3

Telephone: 292-4650

Fax: 292-4644

Industry and Science Canada

Consumer Affairs

10225 -100 Avenue

Edmonton, AB

T5J 0A1

Telephone: 495-2485

Fax: 495-6451

Or

301, 510 - 12 Avenue SW

Calgary, AB

T2R 0H3

Telephone: 292-5604

Fax: 292-6175

PROFESSIONAL ASSOCIATIONS

The Alberta Association of Architects

10515 Saskatchewan Drive

Edmonton, AB

T6B 4S1

Attention: Penny A. Cairns, Executive Director and Registrar

Telephone: 432-0224

Fax: 439-1431

Alberta Association of Landscape Architects

4246 - 97 Street

Edmonton, AB

Telephone: 435-9902

Attention: Bonnie Holtby, Office Manager

Alberta Professional Photographers Association

16136 - 110B Avenue

Edmonton, AB

Telephone: 483-4275

Alberta Society of Engineering Technologies (ASET)

1520 Royal Trust Tower

Edmonton, AB

Telephone: 425-0626

Attention: Deb Key, Volunteer Coordinator

Association of Professional Engineers, Geologist and Geophysicists of Alberta (APEGGA)

15th Floor, 10060 Jasper Avenue

Edmonton, AB

Telephone: 426-3990

Attention: Jeannie Keaschuk

Consumer's Association of Canada (Alberta)

10036 - 100 Street

Edmonton, AB

Telephone: 426-3270

Attention: Wendy Armstrong

Interior Designers of Alberta

200, 317 - 37 Avenue NE

Calgary, AB

Telephone: 276-5088

Attention: Donna Cooper, Education Representative

Society of Graphic Designers of Canada

Alberta Chapter

c/o Department of Art and Design

University of Alberta

Edmonton, AB

T6G 2C9

Telephone: 492-3261

Society of Manufacturing Engineers

Contact: David Richards, Calgary

Telephone: 266-1030

Contact: Richard Cowles, Edmonton

Telephone: 455-6059

DISTRIBUTOR DIRECTORY

The entries in the distributor directory are arranged alphabetically by code.

Code	Distributor/Address	Telephone/Fax
ACC	ACCESS Network 3720 - 76 Avenue Edmonton, AB T6B 2N9	(403) 440-7777 Fax: 440-8899 1-800-352-8293
ITF	International Tele-Film Enterprises Ltd. 5090 Explorer Drive, Suite 301 Mississauga, ON L4W 4T9	(905) 629-3133 Fax: 629-1211 1-800-561-4300
LRDC	Learning Resources Distributing Centre 12360 - 142 Street Edmonton, AB T5L 4X9	(403) 427-2767 Fax: 422-9750
NEL	Nelson Canada See LRDC Buyers Guide for information	
VEC	Visual Education Centre 41 Horner Avenue, Unit 1 Toronto, ON M8Z 4X5	(416) 252-5907 Fax: 251-3720

CAREER & TECHNOLOGY STUDIES

DESIGN STUDIES

SAMPLE STUDENT LEARNING GUIDES

INTERIM 1994

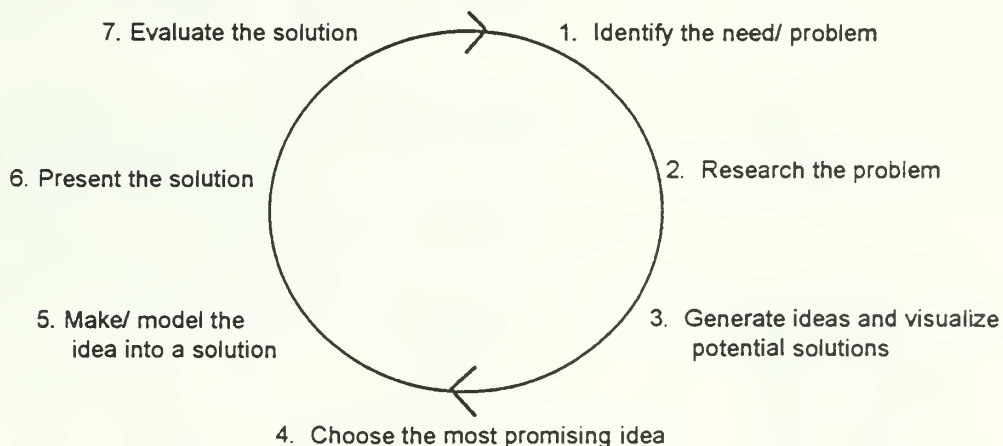


WHY

TAKE THIS MODULE?

Design is about solving problems. Some of these problems are given to you while other ones you find yourself. For example, you may be asked by someone else (like your Students' Council) to design a poster to advertise a school dance. On the other hand, you may give yourself the job of designing a poster to advertise a garage or yard sale you are having. In each case the problem is the same - trying to inform other people about an event. Whether the problem facing you is small or large, there is a process you will go through to solve it.

There are several different problem solving strategies that designers use but all of them have some common elements. This diagram illustrates a basic problem-solving model:



Designers use this type of problem solving strategy all the time. Sometimes, if the problem is quite simple, they may skip a step or two, but they must at least think about it. For complex problems, the designer may repeat steps several times as the problem is reconsidered and different alternatives are tried. It is essential for designers to be curious and not to be satisfied with their first idea or possible solution.

WHAT DO YOU NEED TO KNOW BEFORE YOU START?

No previous experience is required for this module. To be successful however, you should be comfortable with experimenting with new ideas, with trying new things and you should not be satisfied with the first idea that you come up with.



WHAT WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?



In this module you will be asked to solve three different problems. By following the design process previously described when solving these problems, you will be able to:

- ☒ identify the seven components of this process
- ☒ use the process when problem solving
- ☒ use a variety of tools and materials depending on the solutions you generate in response to the design problems
- ☒ explain how you used the process supported by examples of your work
- ☒ present you work other people
- ☒ keep notes and ideas about your projects in your Design Journal

WHEN SHOULD YOUR WORK BE DONE?

You have three projects to complete during this module and I have scheduled a total of 24 classes (4 weeks) for you to complete your work. As this is the first time you will have worked with the design process, I will help you organize your time. Please recognize that if you miss a class, you are still responsible for completing the work. Similarly, if you finish the projects for this module ahead of schedule, you can move on to another module.

You will need to follow this timeline:

Module Overview

- ☑ Class 1 overview of the design process and the project expectations

Project 1: Design Brief: Working Portfolio

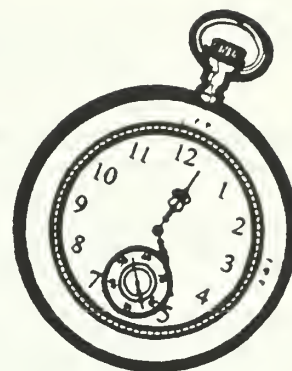
- ☑ Class 2 introduction to design brief/ problem identification; use Design Journal to keep research notes and generate ideas
- ☑ Class 3 construct portfolio
END of Project 1

Project 2: Design Brief: Personal Monogram

- ☑ Class 4 introduction to design brief/ problem identification
use Design Journal to keep research notes and to begin generating ideas
- ☑ Class 5 continue generating ideas
select your best idea
select tools and materials needed for the project
discuss selections with me
- ☑ Class 6 expand idea to full size through rough drawings
- ☑ Class 7 interim review of all projects to compare ideas and make adjustments
- ☑ Class 8 work on design
- ☑ Class 9 work on design, presentation mounting
demonstration
- ☑ Class 10 finish design and mount for presentation
- ☑ Class 11 present project 2
END of Project 2

Module Review Day

- ☑ Class 12 review design process
share, answer questions, make adjustments



Project 3: Design Brief: Materials Container for a Child OR Pencil Holder

- ☒ Class 13 introduction to design brief/ problem identification
use Design Journal to keep research notes and to begin generating ideas
- ☒ Class 14 continue doing research and generating ideas
- ☒ Class 15 finish generating ideas
select your best idea
select tools and materials needed for the project
discuss selections with me
- ☒ Class 16 orientation to selected tools and materials
- ☒ Class 17 expand idea to full size or specified scale size
through rough drawings and/ or model
- ☒ Class 18 through 19 - work on design
- ☒ Class 20 interim review of all projects to compare ideas and make adjustments
- ☒ Class 21 through 22 - work on design
- ☒ Class 23 finish design and prepare for presentation
- ☒ Class 24 present project 2
END of Project 2

HOW

**WILL YOUR MARK FOR THIS
MODULE BE DETERMINED?**

	PERCENTAGE
<input checked="" type="checkbox"/> My observation of your use of the design process during each project and the quality of your Design Journal with respect to the evidence of problem identification, research notes, ideas generated, and any additional questions and/ or ideas identified during the course of the module.	50%
<input checked="" type="checkbox"/> Successful completion of each project: Project 1 10% Project 2 15% Project 3 15%	40%
<input checked="" type="checkbox"/> Presentation of each project and discussion of your work; presentation of your portfolio showing completed projects and use of the design process	10%



WHICH RESOURCES MAY YOU USE?



- ☒ Baird, Tom. Communicating Design (Design and Technology in Action series). Heinemann Educational, Oxford, 1990
- ☒ Chapman, C., and Peace, M.; Breckon, A. (Editor). Collins CDT: Design and Realization. Collins Educational, 1988
- ☒ Crampton, K., and Finney, M.; Breckon, A. (Editor). Collins CDT: Design and Communication. Collins Educational, 1988
- ☒ Fair, David and Kenny, Marilyn. Design Graphics: Drawing and Presenting Your Design Ideas. Hodder and Stoughton, 1987
- ☒ Shadrin, Richard L.. Design and Drawing: An Applied Approach. Davis Publications, Inc., Worcester, 1992
- ☒ Tufnell, Richard. Introducing Design and Communication. Hutchinson, London, 1986

ACTIVITIES/WORKSHEETS

Project 1:

Brief: WORKING PORTFOLIO

Problem: In a design class, you very quickly gather together a lot of paper and other materials, some of which you will want to keep. You will also have finished projects that must be kept safe. Design a holder (portfolio) for this material that you can use throughout your stay in Design Studies to safely keep your ideas, rough work and finished work.

Constraints:

- ☒ The portfolio must be able to contain flat work on card 56 cm X 71 cm
- ☒ The portfolio must lie flat for storage
- ☒ Your name must be legibly written and prominently displayed on the outside of the portfolio

Materials:

<input checked="" type="checkbox"/> cardboard	<input checked="" type="checkbox"/> coloured markers
<input checked="" type="checkbox"/> binding tape	<input checked="" type="checkbox"/> x-acto knife and scissors
<input checked="" type="checkbox"/> newsprint	<input checked="" type="checkbox"/> design journal
<input checked="" type="checkbox"/> ruler	

Procedure:

- ☒ Study different types of containers and folders
- ☒ Review resources for ideas
- ☒ Develop at least three different ideas for the two-dimensional (visual) design of your portfolio
- ☒ Try selected design in rough on newsprint
- ☒ Try bending, folding and binding with samples of materials supplied
- ☒ Finalize two-dimensional (visual) design, apply it to the three-dimensional design (folder) and construct the folder
- ☒ Present project portfolio

Project 2:**Brief: PERSONAL MONOGRAM**

Problem: In the middle ages, knights had their monograms emblazoned on their shields so everyone would know who they were even when they were in full armor. Today individuals and companies develop trademarks, logotypes and monograms to identify themselves or their business to others and display them on signs, business cards, vehicles, the sides of buildings, etc.. Your task is to design a monogram for yourself that you could use if you started a design company.

Constraints ☒ use your name or your initials
☒ you may use only one colour and tints and/ or shades of that colour

Materials: ☒ newsprint ☒ x-acto knife and scissors
☒ ruler ☒ mounting materials
☒ graphite and coloured pencils ☒ design journal
☒ typography sheets

Procedure: ☒ Study different types of logos, trade marks and monograms in books, magazines and journals
☒ Develop at least three different ideas for the monogram
☒ Try selected design in rough on newsprint
☒ Finalize design on card
☒ Mount finished design for presentation
☒ Present project portfolio

Project 3A:

Brief: MATERIALS CONTAINER

Problem: Everyone has the need for containers to keep things in. For young children, a container is useful for keeping pencils, crayons, erasers, pencil sharpeners, felt tipped pens, paints, brushes and the like that they would use for drawing, colouring and painting. You are asked to design a container which is both durable and attractive and suitable for a child who is 4 to 6 years of age.

Constraints:

- ☒ the interior volume of the container must not exceed 3,000 cubic centimeters
- ☒ if you choose to decorate the container, you may use only one colour and tints and/ or shades of that colour
- ☒ a designated space must be made for the child to place his/ her name on the outside of the container

Materials:

<input checked="" type="checkbox"/> newsprint	<input checked="" type="checkbox"/> x-acto knife and scissors
<input checked="" type="checkbox"/> card board	<input checked="" type="checkbox"/> glue
<input checked="" type="checkbox"/> ruler	<input checked="" type="checkbox"/> design journal
<input checked="" type="checkbox"/> graphite and coloured pencils	<input checked="" type="checkbox"/> <i>wood (optional extension)</i>
<input checked="" type="checkbox"/> coloured markers	<input checked="" type="checkbox"/> <i>plastic sheeting (optional extension)</i>

Procedure:

- ☒ Study different types of containers: their uses, the materials they are made from, how they are constructed, how their interior space is organized, what size they are in relationship to what they contain, etc.. Note this information and any ideas you have in your design journal.
- ☒ Develop at least three different ideas for the container you are designing.
- ☒ Make a scale model (scale 1:2) of your selected design out of newsprint and revise as required.
- ☒ Make a full sized model of your selected design out of cardboard and decorate appropriately.
- ☒ Present project portfolio
- ☒ *Project Extension: You may make a prototype of your container out of wood or plastic if you want, however this would be for your own personal use and not be considered part of the project.*

Project 3B:**Brief: PENCIL HOLDER**

Problem: Office Products Limited, a small office supply firm wants to send out a promotional product to their customers. The company's owner has come up with the idea of a cardboard pencil holder that can be mailed out to her customers (flat) and then assembled by the recipient. Cost and time are both factors as this promotion will be followed in three months by a new catalogue. Yours is one of several designer firms that have been asked to submit designs for the pencil holder. You are to produce a prototype for evaluation by the company president and sales manager in two weeks time.

Constraints:

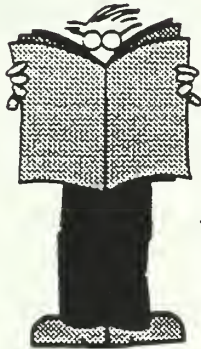
- The pencil holder laid out flat must fit within a manila envelope with the interior dimensions no larger than 22.5 cm x 30 cm
- The company name, Office Products Limited must be visible on the holder
- The holder must accommodate at least three standard pencils
- No more than one colour and tints and shades of that colour may be used in addition to the colour of the cardboard
- Approximate time required 10 hours

Materials:	Newsprint	Two-sided tape
	Cardboard	Ruler
	Graphite and coloured pencils	Coloured markers
	Coloured markers	X-acto knife and/or scissors
	Typography sheets	Design journal
	Glue	

Procedure:

- Study a pencil and try supporting it above your desk in different ways. Conduct research into "pencil holders" and desk organizers by looking at as many different kinds as you can (at home, in stores, through books and magazines)
- Develop at least three ideas in your design journal for the shape of the pencil holder and for the graphics (lettering and colour). Support your sketches by writing down details about your ideas
- Try bending, folding and cutting scrap cardboard into different shapes. Experiment with different ways of joining the cardboard using tabs, glue, two-sided tape
- Select your most promising idea
- Make a model of your design and test it with the pencils
- Make your prototype
- Present project portfolio

WHY TAKE THIS MODULE?



Having the ability draft out ideas so other people can understand them is very important in design. Designers often work collaboratively (together with others) on projects and therefore communication between the team members becomes very important. Well drafted designs contribute to this communication. Also, designers need to be able to communicate their ideas to their clients, and the clients need to be able to understand the ideas being proposed and make suggestions and modifications. Again, this is communication.

WHAT DO YOU NEED TO KNOW BEFORE YOU START?

You need to be able to look at an object (e.g., a cup, a plant, a telephone) and draw it freehand with reasonable so that a person looking at your drawing is able to identify the object, recognize its shape, form and relative dimensions and see some of the detail it possess. You will be able to do this if you have successfully completed module DES101 - Sketching, Drawing and Modelling - Fundamentals or you may have acquired these skills through other classes such as Art.



WHAT

WILL YOU KNOW AND
BE ABLE TO DO
WHEN YOU FINISH?



In this module you will learn basic drafting skills and techniques which you can use to visualize and illustrate your design ideas. You will also learn some of the basic terminology common to the drafting area. This will include:

- ☒ drawing in isometric, oblique, and one- and two- point perspective
- ☒ producing dimensioned multiview drawings
- ☒ selecting and using drafting equipment, tools and materials
- ☒ presenting your work to other people
- ☒ keeping notes and ideas about your work in your Design Journal

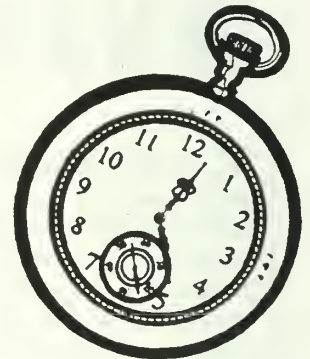
WHEN

SHOULD YOUR WORK BE DONE?

A total of 24 classes (4 weeks) are available to you to complete your work. As this is the first time you will have worked in the drafting for design area, you will be doing a mixture of exercises and related projects. The exercises will teach you specific skills and the projects will show you how they can be applied. The following timeline will be adhered to. Please recognize that you are responsible for all work even if you miss a class. Similarly, if you finish the work for this module ahead of schedule, you can move on to another module.

Module Overview

- ☒ Class 1 - overview of schedule and module expectations
overview of different types of drawings and their uses
 - pictorial drawings
 - multiview drawings (first and third angle projection)overview of equipment, tools and materials, and techniques and associate safety
Note: use Design Journal to keep notes



Exercise 1: Pictorial Drawing Skills; Equipment, Tools, Materials and Techniques

- ☑ Class 2 - freehand pictorial drawings based on real objects
- ☑ Class 3 - freehand pictorial drawings using drawing grids
- ☑ Class 4 - equipment, tools and materials, and basic drafting techniques;

Note: use Design Journal to keep notes

Project 1: Office Desk

- ☑ Class 5 - introduction to project brief;
select equipment, tools and materials
begin drawings
- ☑ Class 6 - continue drawings
- ☑ Class 7 - continue drawings
- ☑ Class 8 - continue drawings
- ☑ Class 9 - finish drawings

Project 2: 'MEGABLOCKS'

- ☑ Class 10 - introduction to project brief; select equipment, tools and materials; begin drawings
- ☑ Class 11 - continue drawings
- ☑ Class 12 - continue drawings
- ☑ Class 13 - finish drawings
- ☑ Class 14 - mount and display drawings from Projects 1, 2, and 3

Module Review Day

- ☑ Class 15 - review pictorial drawings; present drawings from Projects 1, 2, and 3; share ideas and answer questions

Exercise 2: Creating Multiview Drawings

- ☑ Class 16 - drawing objects from different views; some drawing conventions (borders, title block);
dimensioning: what it is and why it is necessary;
equipment, tools and materials and some basic techniques;
Note: use Design Journal to keep notes
- ☑ Class 17 - practice drawings
 - front view, side view, top view
 - positioning on the drawing sheet
 - dimensioning

Project 3: 'GOGO CAR'

- ☑ Class 18 - introduction to project brief; equipment, tools and materials; drawing
- ☑ Class 19 - continue drawing
- ☑ Class 20 - continue drawing
- ☑ Class 21 - finish drawing
- ☑ Class 22 - mount and display drawings from Project 4
- ☑ Class 23 - review multiview drawings
present drawings from Project 4
share ideas and answer questions
- ☑ Class 24 - wind up day, module test.

HOW WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
<ul style="list-style-type: none"> • Successful completion of each exercise and project: <ul style="list-style-type: none"> Exercises and test 10% Project 1 20% Project 2 20% Project 3 <u>30%</u> 80% 	80%
<ul style="list-style-type: none"> • Presentation of projects and discussion of your work testing general understanding; of drafting terminology, procedures, conventions, etc. 	20%



WHICH RESOURCES MAY YOU USE?



- ☒ Baird, Tom. Communicating Design (Design and Technology in Action series). Heinemann Educational, Oxford, 1990
- ☒ Crampton, K., and Finney, M.; Breckon, A. (Editor). Collins CDT: Design and Communication. Collins Educational, 1988
- ☒ Fair, David and Kenny, Marilyn. Design Graphics: Drawing and Presenting Your Design Ideas. Hodder and Stoughton, 1987
- ☒ Hepler, D. E., Wallach, P. R. and Hepler D. J. Architecture, Drafting and Design, Sixth Edition, Glencoe/ McGraw - Hill, 1991
- ☒ Kicklighter, C. E., Baird, R. J. and Kicklighter, J. C. Architecture: Residential Drawing and Design. The Goodheart - Willcox Company, Inc., 1990
- ☒ Walker, J. R. Exploring Drafting: Fundamentals of Technology. The Goodheart - Willcox Company, Inc., 1991

ACTIVITIES/WORKSHEETS

Exercise 1: Pictorial Drawing

- ☒ Select an object from those provided to you and use it as a reference of each of the drawings. You will be lead through each of the drawings.
- ☒ Produce *one of each* of the following drawings using a pencil and ruler:
 - isometric
 - oblique
 - one- point perspective
 - two- point perspective
- ☒ Produce *one* of the following drawings using a pencil and drawing grid:
 - isometric
 - oblique
- ☒ Produce *one* of the following drawings using a t-square, 30, 60, 90 set square and circle and ellipse templates:
 - isometric OR
 - oblique
 - one- point perspective
 - two- point perspective
- ☒ Note: use your Design Journal to keep notes.

Project 1: Isometric and Oblique Drawings

Brief: OFFICE DESK

Problem: A desk manufacturer is putting out a catalogue of their products. One of these products will be a new line of double pedestal office desks made of metal with wooden veneer on the drawers and top. You have been provided with plans for the desk, and a sketch of what it will look like when assembled. Your job is to produce and isometric drawing or a cabinet oblique drawing of the desk that can be used as an illustration of the product in the new catalogue.

Constraints: ☒ Drawing must be completed on a sheet with dimensions (21.5 cm X 28 cm).

Materials:

<input checked="" type="checkbox"/> drawing paper (21.5 cm X 28 cm)	<input checked="" type="checkbox"/> t-square
<input checked="" type="checkbox"/> pencil	<input checked="" type="checkbox"/> 30, 60, 90 set square
<input checked="" type="checkbox"/> eraser	<input checked="" type="checkbox"/> Design journal
<input checked="" type="checkbox"/> ruler	

Procedure:

- ☒ Study the dimensioned plan and sketch you are provided with
- ☒ Draw desk with pencil using "light" lines
- ☒ Indicate texture on veneered portions of desk
- ☒ Darken in lines where appropriate
- ☒ Finish Drawing
- ☒ Place drawing in portfolio

Project 2: One- and Two- point Perspective Drawing

Brief: MEGABLOCKS

Problem: Toys For Tots is a major Canadian toy manufacturer. They specialize in making toys for children ages four and under. A new product line "MEGABLOCKS" has recently been designed and will be available to customers early next year. "MEGABLOCKS" are large colourful blocks of light weight foam that come in cubes, cylinders, triangular prisms, cones and pyramids. The dimensions of each cube are 30 cm x 30 cm x 30 cm with the other forms not exceeding this size. They can be stacked by children in different ways to produce towers, walls, chairs, etc.

The company has asked you to diagram each of the forms in one point and two point perspective and to draw a composition of the blocks in an arrangement a typical four year old child might make. The composition may be done using one- or two- point perspective. Three presentation drawings will be required.

Constraints:

- ☒ Drawing must be completed on a sheet of cartridge paper.
- ☒ The drawing must be done in pencil
- ☒ Cast shadows and highlights may be included (optional).

Materials:

<input checked="" type="checkbox"/> cartridge paper	<input checked="" type="checkbox"/> ruler
<input checked="" type="checkbox"/> pencil	<input checked="" type="checkbox"/> design journal
<input checked="" type="checkbox"/> eraser	<input checked="" type="checkbox"/> sample reference forms (e.g., cone, cube, cylinder)

Procedure:

- ☒ Study the different forms from various angles and experiment with the different forms in various lighting conditions.
- ☒ Prepare line drawings of each form using one- and two- point perspective.
- ☒ Using either one- or two- point perspective, compose forms on a page as a four year old child might arrange them when playing.
- ☒ Finish Drawing
- ☒ Mount perspective drawings and isometric or oblique drawing
- ☒ Present drawing portfolio

Exercise 2: Multiview Drawings

- ☒ Select an object from those provided to you and use it as a reference of each of the drawings. I will lead you through each of the drawings.
- ☒ Produce the following drawings using a pencil, ruler, t-square and set square:
 - border and title block
 - front view
 - top view
 - side view
- ☒ Dimension the drawings produced and add information to title block.
- ☒ Using isometric grid paper, produce a pictorial representation of the object represented by the multiview drawing.
- ☒ Note: use your Design Journal to keep notes

Project 3: Multiview Drawing

Brief: GO-GO CAR

Problem: Toys For Tots is a major Canadian toy manufacturer. They specialize in making toys for children ages four and under. Market research done by the company suggests that there is a need for a children's riding toy made of colourful plastic for children with an average age of three years. This new toy called the "GO-GO car" will go into production early next year. "GO-GO car" will be designed using basic forms (e. g.; cube, cylinder, triangular prism, cone and pyramid) and will be sold in a colourful cardboard box with the outside dimensions of 70 cm x 40 cm x 40 cm.

The company has asked you to do basic working drawings for the "GO-GO car" including a front view, side view, top view and a pictorial representation using isometric projection. The completed drawings should be composed for presentation on one presentation sheet.

Constraints:

- ☒ Composition dimensions are 43 cm x 56 cm.
- ☒ Three views must be completed in pencil.
- ☒ Pictorial representation must indicate tone (colour is optional).
- ☒ Border and title block must be included.
- ☒ Manufacture, product name, your name, date drawn and scale of drawing must be included in title block information.

Materials:

<input checked="" type="checkbox"/> cartridge paper and/or vellum	<input checked="" type="checkbox"/> t-square
<input checked="" type="checkbox"/> pencil	<input checked="" type="checkbox"/> 30, 60, 90 set square
<input checked="" type="checkbox"/> eraser	<input checked="" type="checkbox"/> design journal
<input checked="" type="checkbox"/> ruler	<input checked="" type="checkbox"/> coloured pencils (optional)
<input checked="" type="checkbox"/> isometric graph paper	<input checked="" type="checkbox"/> sample "GO-GO car" (may be used for reference)

Procedure:

- ☒ Carefully examine the sample 'GO-GO car' or sketches and dimensioning information provided.
- ☒ Select an appropriate scale in which to produce your drawings.
- ☒ Produce a front view, top view and side view.
- ☒ Prepare an isometric projection of the product.
- ☒ Finish drawings.
- ☒ Present drawing portfolio.

WHY TAKE THIS MODULE?

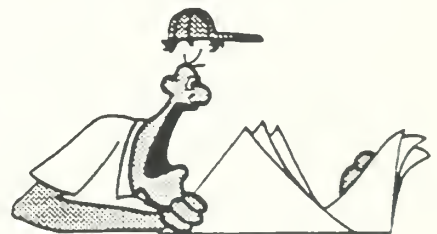


Designers who work in architecture, interior and environmental design must consider many factors as they design living spaces for their clients. The needs of the clients will vary depending on the intended outcome. For example, a person who owns a restaurant and wants to design its interior will require an outcome that will be aesthetically pleasing so customers will be attracted to the restaurant and feel comfortable once they arrive. This person will also want a design that is functional, easy to maintain and durable because it will need to serve many people over a long period of time. Some of these same qualities will also be required in this person's home, although the home design will be quite different from that of the restaurant. Similarly, this person and their family will also spend time in other environments such as public parks and will require a variety of services from the park(s) they go to.

As a group being given the task of designing a living environment, you must consider the needs of human beings, the needs of the environment, the aesthetic and functional quality of your designs, the best materials to use to produce the design and how the final product can best be produced either singly or in quantity. Throughout integrated project, you and/ or your group will make decisions and answer questions pertaining to the design of a living environment for human use. Good luck.

WHAT DO YOU NEED TO KNOW BEFORE YOU START?

To be successful in this integrated project you will need to be comfortable working as a member of a design group and using a design process. You will need to do research and use your findings to create new solutions. You should have completed DES201 2D Design - Applications or DES202 3D Design Applications and also DES204 Drafting For Design - Applications.



WHAT WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?



In this integrated project you will be asked to design a solution to one of three briefs based in Architectural Design; Environmental Design or Interior Design. Through this project you will:

- ☒ identify and address human and environmental needs pertaining to the brief chosen
- ☒ use the elements and principles of design to create a functional and aesthetically pleasing design
- ☒ work as a productive member of a design group
- ☒ select and use a variety of equipment, tools and materials to produce your design
- ☒ formally present your work others, defending the project and justifying the decisions made with respect to materials, production processes, design specifications, and other matters arising during the course of the project
- ☒ keep notes and ideas about your project in your Design Journal

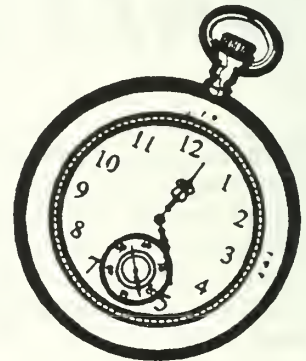
WHEN SHOULD YOUR WORK BE DONE?

Approximately 70 classes (11 weeks) should be required to complete this project. Please recognize that you are responsible for organizing your time. Key dates have been identified where your group will be expected to present your work and discuss it with other design groups and/ or guest designers. The final six classes will be set aside for final presentations and critiques and for display assembly.

You should use this timeline as a guide:

Module Overview

- ☒ Class 1 - overview of the living environments modules and the design briefs
design group assembly
selection of design brief



Design Project:

- ☑ Class 2 review selected brief and begin work
- ☑ Class 5 present research findings and preliminary ideas
- ☑ Class 6 begin to narrow down design alternatives
- ☑ Class 20 present and discuss work to date on short listed alternatives
provide and receive feedback on rough work, mock ups, preliminary models
- ☑ Class 21 select best alternative
begin alterations based on feedback
- ☑ Class 35 present and discussion of work to date
provide and receive feedback
- ☑ Class 36 begin alterations based on feedback
begin final version of project
- ☑ Class 62 make final touches to project
- ☑ Class 63 prepare for presentation critique
- ☑ Class 64 begin presenting projects
- ☑ Class 70 - set up presentation display of design solutions

HOW WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
<input checked="" type="checkbox"/> Successful completion of project	70%
<input checked="" type="checkbox"/> Presentation of project and discussion of your work	30%



WHICH RESOURCES MAY YOU USE?



- ☒ Ching, Francis D. K.. Interior Design Illustrated. Van Nostrand Reinhold, New York, 1987
- ☒ Foundation for the Advancement of Science and Education (PBS). Future Habitats (Futures 2 series), 1992 Distributed by Visual Education Centre (VEC)
- ☒ Foundation for the Advancement of Science and Education (PBS). Graphic Design (Futures 2 series), 1992 Distributed by Visual Education Centre (VEC)
- ☒ Foundation for the Advancement of Science and Education (PBS). Industrial Design (Futures 2 series), 1992 Distributed by Visual Education Centre (VEC)
- ☒ Hepler, Donald E., Wallach, Paul R. and Hepler, Dana J.. Architecture Drafting and Design 6th Edition. Glencoe/ McGraw - Hill, 1991
- ☒ Hubel, Vello and Lussow, Diedra B.. Focus on Designing. McGraw-Hill Ryerson Limited, Toronto, 1984
- ☒ Kicklighter, Clois E., Baird, Ronald J. and Kicklighter, Joan C.. Architecture: Residential Drawing and Design. The Goodheart-Willcox Company, Inc., South Holland, Illinois, 1990
- ☒ Kilmer, Rosemary and Otie Kilmer. Designing Interiors. Orlando, Florida: Harcourt, Brace, Jovanovich, 1992.
- ☒ Shadrin, Richard L.. Design and Drawing: An Applied Approach. Davis Publications, Inc., Worchester, 1992
- ☒ Tufnell, Richard. Introducing Design and Communication. Hutchinson, London, 1986

ACTIVITIES/WORKSHEETS

Project: Architectural Design

Choose *one* of the following projects:

- Brief 1:** Design a lunar community suitable for continuously sustaining life on the Earth's moon.
- Brief 2:** Design a condominium complex for seniors.
- Brief 3:** Design your dream house.
- Brief 4:** Design a Velodrome for the Olympic Summer Games of 2004.
- Brief 5:** Design the Information Centre of a wildlife theme park.

Project: Environmental Design

Choose *one* of the following projects:

- Brief 6:** Design an inner city public park of no less than 5 hectares.
- Brief 7:** Design an aviary for a local zoo.
- Brief 8:** Design a coastal fish farm.
- Brief 9:** Design a space station.
- Brief 10:** Design a sterile environment for a hospital emergency ward.

Project: Interior Design

Choose *one* of the following projects:

- Brief 11:** Design the interior of a day care centre.
- Brief 12:** Design the interior of a coffee house and deli.
- Brief 13:** Design the interior of a veterinarian's clinic.
- Brief 14:** Design the interior of a one bedroom apartment.
- Brief 15:** Design the interior of an underwater research station.

Design Briefs: Architectural Design

Brief 1: LUNAR COLONY

Problem: It is the year 2010 and the first lunar colony is being planned by an international space exploration consortium. The Canadian Space Agency as a member of that consortium has asked for design proposals. Your architectural design group has agreed to submit a proposal in the form of scale drawings, a scale model and a prospectus describing:

- ☒ the components
- ☒ the materials to be used
- ☒ where the components would be manufactured
- ☒ how the components would be transported
- ☒ how the colony would be assembled on the moon
- ☒ how the features of your design will meet the needs of colonists.

Constraints: ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 2: SENIOR'S CONDOS

- Problem:** Your architectural design group is bidding on an adult condominium complex for seniors. The complex is to have forty separate residences, a community/ recreation, and a manager's office. As some of the prospective residents may be disabled, wheelchair access to all facilities is required. The building site is in a suburban community supported by all utilities and by public transportation. A project proposal must be submitted in the form of scale drawings, a scale model and a prospectus describing:
- ☒ the components of the condominium complex
 - ☒ the materials to be used
 - ☒ how the features of your design will meet the general needs of the residents
 - ☒ features of your design which are unique and how these will benefit the residents
 - ☒ why your design proposal should be selected
- Constraints:** ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 3: DREAM HOUSE

Problem: You have won three million dollars in the 649 lottery. You have decided to design and build the house of your dreams. The house may be located in an urban or rural setting. Total cost of property acquisition, utilities installation and house construction must not exceed one million dollars (Canadian).

The local land development board requires the following which you must provide before and development or construction can begin:

- ☒ a site plan showing utilities access
- ☒ a floor plan of the house
- ☒ front and side elevations
- ☒ plumbing, heating and electrical diagram
- ☒ a prospectus describing the house and its significant features which will have an impact on the building permit (e.g., fireplace, hot tub, pool, sauna, solarium)

Constraints: ☒ Drawings must be completed on vellum.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience.

Brief 4: OLYMPIC VELODROME

- Problem:** A major Alberta centre is submitting a request to host the 2004 Olympic Summer Games. Part of the submission includes drawings, diagrams and/ or models of proposed venues. Your design group has been asked to submit a design for the Velodrome, a new cycling facility to be constructed in a rolling, park- like setting on the western outskirts of the city. A project proposal must be submitted in the form of scale drawings, a scale model and a prospectus describing:
- ☒ the components of the velodrome complex
 - ☒ how the complex will relate to and take advantage of the surrounding natural features
 - ☒ how contestants and spectators will be able to access the site, the competition area and the viewing area
 - ☒ public facilities such as food concessions, washrooms, parking
 - ☒ why your design proposal should be selected
- Constraints:** ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 5: VISITOR'S CENTRE

- Problem:** Kananaskis Country is a major recreation area of Albertans and also attracts visitors from around the world. It is characterized by beautiful scenery and abundant wildlife. A new Visitor's Centre is required that will serve tourists on a year around basis. Your design group is asked to submit a design proposal for the Centre. The proposal must be submitted in the form of scale drawings, a scale model and a prospectus describing:
- ☒ the components of the Visitor's Centre
 - ☒ how the Centre will relate to and take advantage of the surrounding natural features
 - ☒ how staff will be accommodated
 - ☒ public facilities such as food concession, washrooms, parking
 - ☒ any special features (e.g., adjacent trails, emergency facilities, interpretive information centres)
 - ☒ why your design proposal should be selected
- Constraints:**
- ☒ Drawings must be completed on vellum.
 - ☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Design Briefs: Environmental Design

Brief 6: INNER CITY PARK

- Problem:** As part of the revitalization of the core of a major Canadian city, planners have proposed the development of a park that would serve the public throughout the year. The proposed site has an area of 5 hectares, is bordered on two sides by a shallow canal frequented by boaters in the summer and has a monument to Canada's veterans (which can not be moved) within its boundaries. A call for proposals has been made and your design group has been asked to prepare a design for the park. The proposal must be submitted in the form of scale drawings, a scale model and a prospectus describing:
- ☒ the parks major features
 - ☒ how the park will relate to and take advantage of the surrounding natural and previously built features
 - ☒ the kind of use the park is likely to receive at different times of the day and in different seasons
 - ☒ public facilities such as food concessions, washrooms, water fountains, playgrounds
 - ☒ any special features (e.g., fountains, sports fields, performing arts centres)
 - ☒ why your design proposal should be selected
- Constraints:** ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 7: ZOO AVIARY

- Problem:** A zoo has received a donation of five million dollars from a wealthy benefactor and bird fancier for the purpose of building and stocking an aviary. The building will be attached to an existing single story structure used for zoo administration and containing a small restaurant. You are to design the aviary and submit concept drawings and a model of the facility to the zoo's board of directors at their next board meeting scheduled in eleven weeks. You must also submit a prospectus describing:
- ☒ the assortment of birds that would be housed in the facility
 - ☒ how the facility will safely accommodate the birds
 - ☒ how visitors will be able to circulate through the aviary so they can see the birds
 - ☒ how the aviary will relate to and take advantage of the surrounding natural and previously built features
 - ☒ the kind of use the aviary is likely to receive at different times of the day and in different seasons
 - ☒ public facilities such as washrooms
 - ☒ any special features (e.g., fountains, plant life, theme areas such as different climatic zones)
 - ☒ why your design proposal should be selected
- Constraints:**
- ☒ Drawings must be completed on vellum.
 - ☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 8: COASTAL FISH FARM

- Problem:** An opportunity has come your way to join a partnership which is establishing a commercial fish farm located in a sheltered inlet on the east coast of Vancouver Island, British Columbia. Indigenous varieties of fish will be raised in pens and shipped to market in Nanamo. You are to design the farm including the pens, feed storage, office space and personal lodging for the farm manager. You must also submit a prospectus to your business partners describing:
- ☒ the assortment of fish to be raised in the facility
 - ☒ how the fish farm will operated
 - ☒ market potential
 - ☒ potential environmental impact of the farm on the surrounding waters and land and the potential impact of these on the farm
 - ☒ any special features (e.g., fish feeding or harvesting equipment, storage facilities)
 - ☒ why your partners should support your design.
- Constraints:** ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 9: SPACE STATION

- Problem:** The Canadian Space Agency as a member of an international space exploration consortium has asked for design proposals for a space station designed to orbit the earth and act as a scientific research facility and a staging facility for space exploration and development. Your design group has agreed to submit a proposal that would describe the living conditions of the people assigned to the station and how these would be accommodated. The submission would take the form of scale drawings, a scale model and a prospectus describing:
- ☒ provision of day- to- day living needs
 - ☒ recreation facilities
 - ☒ work facilities
 - ☒ power sources
 - ☒ heating mechanisms
 - ☒ water production
 - ☒ food production
 - ☒ waste removal
 - ☒ storage and maintenance
- Constraints:** ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 10: STERILE ENVIRONMENT

- Problem:** A hospital serves a community that has a strong industrial and manufacturing base. Some of this industry uses toxic and corrosive materials in their work. Should an accident occur, there is a possibility that workers will be contaminated by some of this material and require immediate hospital treatment in a sterile environment. Your design group has been given the task of designing a self contained sterile environment capable of holding up to five patients at one time. Medical and support personnel must have access to the environment to administer medical treatment and perform other necessary functions. The submission would take the form of scale drawings, a scale model and a prospectus describing:
- ☒ provision of patient's medical needs
 - ☒ provision of patient's day- to- day living needs
 - ☒ access for medical and non- medical personnel
 - ☒ how the environment will be controlled
 - ☒ emergency back up resources (e.g., power, heat, water)
 - ☒ storage and maintenance.
- Constraints:** ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Design Briefs: Interior Design

Brief 11: DAYCARE CENTRE

- Problem:** Just Like Home Daycare is expanding by opening a second daycare in the same community. A suitable location has been found in a strip mall. The space has an area of 200 square metres on one level with an outside door leading to a grassy area that could be converted to a playground. Your design group must develop a floor plan for the building space and design the interior appropriately. Necessary components will include three separate spaces for groups of children, office space for the administration of the daycare, a reception area, signage for the entrance and a plot plan for the playground area. Please submit scale drawings and a scale model of the facility and a prospectus describing:
- ☒ materials required to create an interior design for the daycare
 - ☒ particular features of the facility that would make it attractive to the children and their parents
 - ☒ features that would help the staff in doing their job
 - ☒ how standards are met or facilitated by the design.
- Constraints:** ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 12: COFFEE HOUSE AND DELI

- Problem:** The Fine Food Emporium is well established restaurant serving a standard menu of dishes to long time customers. The opportunity has arisen to expand the business into the adjacent business and the owners have decided to open a specialty coffee house and deli. This new space is located on a busy south west corner with a wide sidewalk on the south side. Your design group is to design the facility and the decor for this business and to suggest a business name based on the decor theme. Please submit scale drawings and a scale model of the facility and a prospectus describing:
- ☒ materials required to create an interior design for the business
 - ☒ particular features of the business that would make it attractive to potential clients
 - ☒ features that would help the staff in doing their job.
 - ☒ how the environment will relate to the existing restaurant.
- Constraints:**
- ☒ Drawings must be completed on vellum.
 - ☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 13: VETERINARY CLINIC

- Problem:** The local animal hospital is slated for replacement in five months. The new facility will have a reception area, office, examination rooms, small animal surgery, large animal surgery, kennel and large animal holding area. Your design group is part of an architectural and engineering firm that has been selected to design the clinic. Your job is to design the decor for the reception area, office area, examination rooms and surgeries. Please submit scale drawings and a scale model of the facility and a prospectus describing:
- ☒ materials required to create an interior design for each area
 - ☒ features that would help the staff in doing their job
 - ☒ features that would increase the comfort and speed the recovery of the animals being cared for.
- Constraints:** ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.
- Materials:** Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.
- Procedure:** Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 14: A LOFTY APARTMENT

Problem: You are moving out for the first time. You have found a loft in an old house that be converted into an apartment. It has sloped ceilings and two windows, one at each end of the space. The owner (your aunt) says that you can convert the loft into an apartment as long as you pay for the materials and pay for or do the work yourself. She will give you free rent for six months in exchange for your design and construction work.

Design the apartment to suit yourself. Please submit scale drawings and a scale model of the facility and a prospectus describing:

- ☒ materials required to create the design
- ☒ particular features that make the apartment your own.

Constraints: ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

Brief 15: UNDERWATER RESEARCH STATION

Problem: Underwater Research and Development has been awarded a contract to design and build an underwater research station that will be submerged in the Lake Huron to test how people adapt to life in an underwater environment. The station will have room for 10 people and contain separate living and working spaces. Your design group must submit a proposal that would describe the living conditions of the people assigned to the station make recommendations with respect to the interior design of the station and how this could enhance the quality of their existence. The submission would take the form of scale drawings, a scale model and a prospectus describing:

- ☒ the decor of the living and working areas
- ☒ recreation facilities
- ☒ how specific features of the design would enhance the living and working conditions.

Constraints: ☒ Drawings must be completed on vellum.
☒ The model must fit on a surface not exceeding one square metre.

Materials: Use materials and equipment of your choice. Have your list approved by your teacher by the end of class 6.

Procedure: Select and use appropriate procedures based on your previous experience. Discuss any modelling construction procedures with your teacher prior to using them.

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The Design Studies strand was developed through the cooperative effort of people from schools, post-secondary institutions, professional associations, business, industry, labour and departments and agencies of the Government of Alberta. Alberta Education would like to extend sincere appreciation to the following individuals and groups.

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The **Career and Technology Studies Advisory Committee** provides recommendations for all CTS curricula.

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Mike Blackwell	Wetaskiwin Composite High School
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Barry Edgar	Grande Prairie Composite High School
George Hildebrandt	Westview Secondary School, Calgary
Kenneth Jacknicke	Post-secondary Education Representative
Graham Johnston	Northern Alberta Institute of Technology, Edmonton
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Len Luders	Red Deer School District No. 104
Eva-Jane Lundgard	Edwin Parr Composite Community School, Athabasca
Sam Perverseff	Alberta Teachers' Association Representative
Connie Peters	Vincent J. Maloney Junior High School, St. Albert
Darren Reeder	Business/Industry Representative
Barry Stangeland	Roland Michener High School, High Prairie
Gordon Welch	CASS Representative
Gordon Worobec	Alberta Teachers' Association Representative

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Teachers from across Alberta participated in the field review of the Design Studies strand.

1992-93 Field Review

Earl Barton	Grande Prairie Composite High School
Bill Brandley	County Central High School, Vulcan
Larry Chetek	Fort Saskatchewan Senior High
David Johansson	Memorial Composite High School, Stony Plain
Karen Nelson	Camrose Composite High School
Ken Pshyk	Glendon School
Marny Schill	Onoway Junior/Senior High School
Peter Sutherland	Lacombe Composite High School
Tony Vanderlee	Lawrence Grassi School and Canmore Collegiate, Canmore

1993-94 Field Review

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Ward Patterson	Breton High School
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Alberta Education, Curriculum Standards Branch

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